THE physical therapy REVIEW

Second Congress Issue

Mechanisms of Muscle Training in Man: Experimental Demonstration of the Overload Principle — HELLEBRANDT and HOUTZ

The Role of the Physical Therapist in the Diagnosis of Peripheral Vascular Diseases — VOGEL, WEINSTEIN, ABRAMSON, and EBEL

The Physical Therapy Profession and the Political Process — ROBINSON

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Volume 36 - Number 6 **June 1956**

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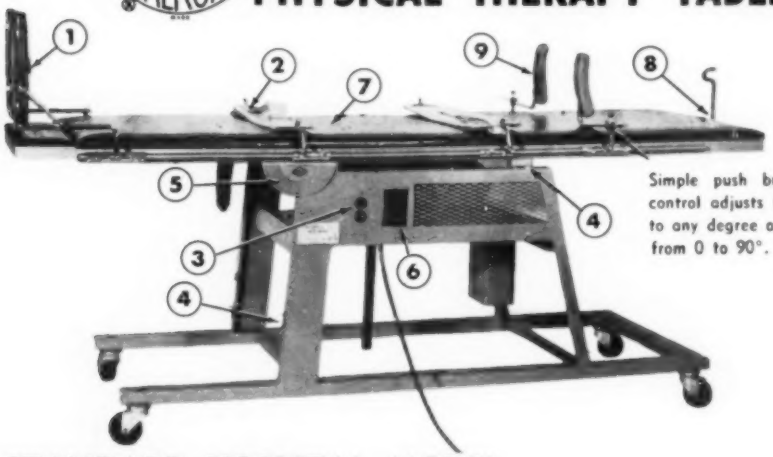

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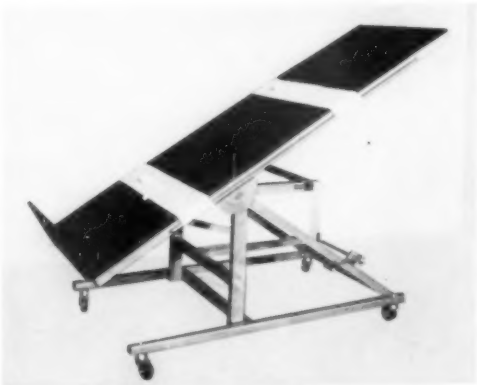

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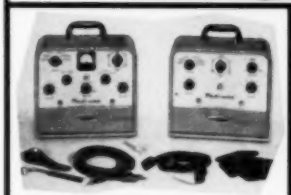

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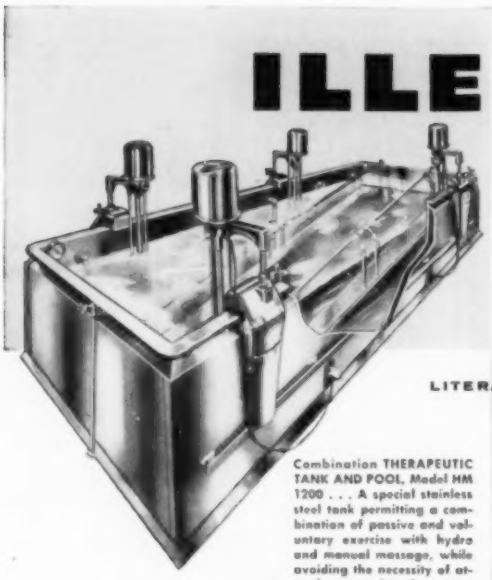

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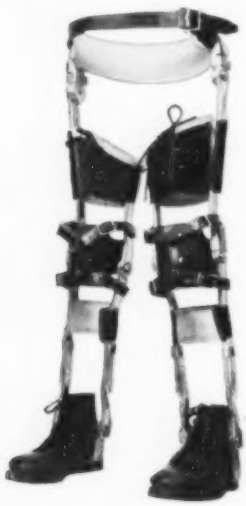

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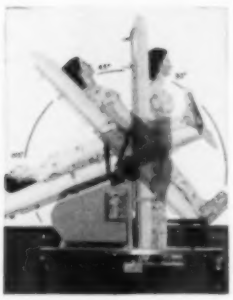

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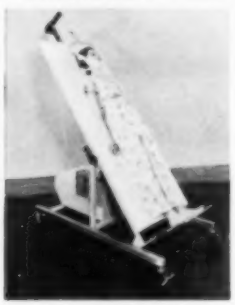

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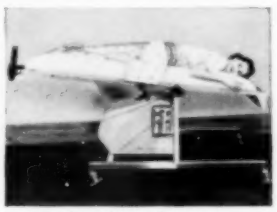

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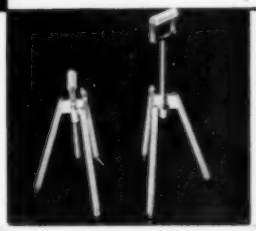

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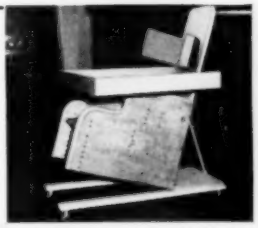

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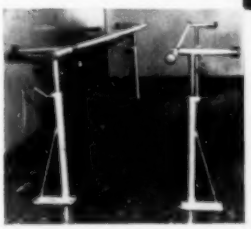

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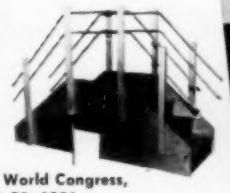

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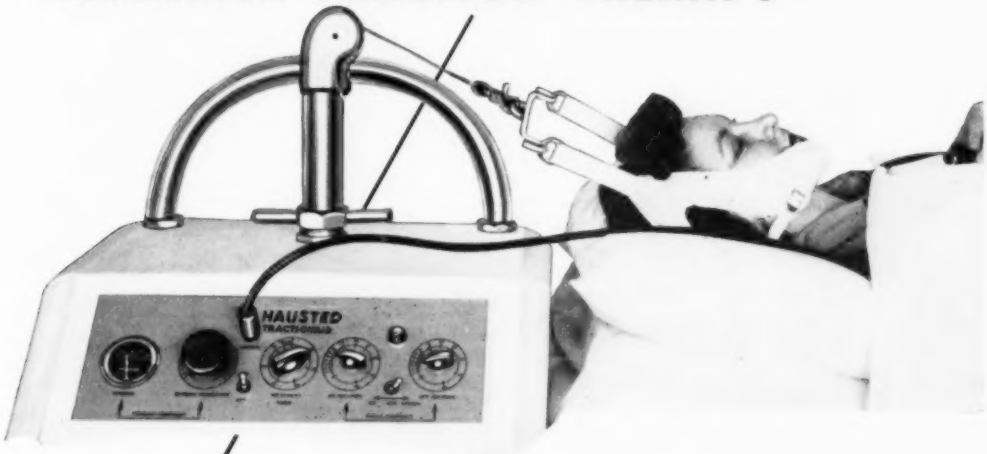

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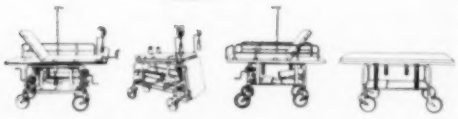

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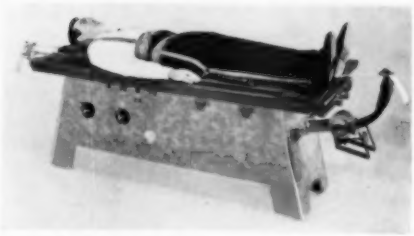

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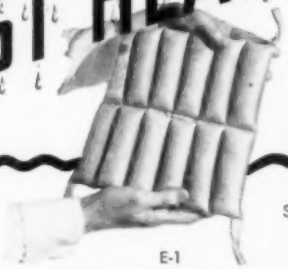

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The Physical Therapy Review

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Mechanisms of Muscle Training in Man:

*Experimental Demonstration of the Overload Principle**

F. A. Hellebrandt, M.D., and Sara Jane Houtz, M.S.

INTRODUCTION

The success of orthopedic surgery is affected to a significant degree by the management of the patient postoperatively. The procedures performed frequently demand either immobilization of the parts subjected to surgery or diminution in their use. Skeletal muscles thus prevented from normal activity undergo atrophy.

Cuthbertson, Howard *et al.*, and Stevenson have discussed the disturbance in mineral metabolism after fractures, prolonged bed rest and skeletal operations. Loss of muscle protoplasm accounts for the negative nitrogen balance. The latter develops rapidly following trauma to bones and is only gradually reversed, even in the presence of high protein feeding. If bed rest is necessary, deconditioning of the body as a whole also occurs as Keys, Taylor *et al.*, and Deitrick, Whedon and Shorr have shown. There is deterioration of the cardiovascular system characterized by a diminution in heart size, reduction in plasma volume, and a long lasting decrease in the ability of the vasomotor system to combat the hydrostatic effects of gravity. These various changes may be ameliorated by massage (Cuthbertson), the oscillating bed (Whedon *et al.*), or exercise (Vail), but apparently cannot be wholly prevented.

The evidence briefly reviewed suggests that the postoperative rehabilitation of the orthopedically disabled offers an ever present challenge, especially in relation to the selection of methods for the restoration of strength, power, and endurance to skeletal muscles weakened by disuse. Exercise *per se* is reparative to a considerable degree, even when the activity program is left to the judgment and discretion of the patient. The curative powers of Nature unaided provide the orthopedic surgeon with a powerful ally, especially if the disabled person is in good general health and is motivated by a desire to resume normal activity. Many factors may supervene, however, which mitigate against spontaneous recovery, prolong convalescence, and lead to baffling degrees of chronic disability (Hellebrandt 1950).

The widespread use of various exercise regimes following orthopedic surgery suggests that end-results may be improved appreciably by the judicious control of postoperative activity programs. It is important, therefore, that the mechanisms of muscle training be understood; only

Dr. Hellebrandt is former Head of the Department of Physical Medicine and Rehabilitation, University of Illinois Research and Educational Hospitals, Chicago; Miss Houtz is Research and Educational Consultant, Detroit Orthopaedic Clinic, Detroit.

* Based on an exhibit presented at the Fall Meeting of the American Physiological Society, Madison, Wisconsin, September, 1954 and the Scientific Section Workshop of the American Physical Therapy Association National Conference, St. Louis, June 1955. Supported in part by the Office of Naval Research (Loan Contract Nonr-750-00) and United Cerebral Palsy of Chicago.

thus may after-care be individualized to meet the particular needs of every patient. The rational application of the principles of muscle training is superior to rote adherence to any one of the systems of exercise described in the literature. The latter readily become so stereotyped as to be rendered more or less ineffective.

The physiological principle upon which the development of strength is dependent is in itself simple. Recently (Snyder) it was put succinctly by Dr. Roger Bannister, the first man in human history to run the four-minute mile. "The art of record-breaking is the ability to take more out of yourself than you've got," said Bannister. "You punish yourself more and more, and rest between spells." Physiologically this is known as the *overload principle*. Clinically it has been incorporated in DeLorme's (1951) progressive resistance exercises. It is also an integral part of the Kabat technics of muscle reeducation, all of which utilize maximal resistance. Both methods are involved technically. Thus the basic idea which gives them their validity is easily overlooked or perverted. The DeLorme system in particular has undergone several procedural modifications which all but nullify the physiological principle upon which the development of strength is based.

The original DeLorme procedure, described in 1945, called for seven to ten bouts of repetitive exercise. From day to day the patient tried to step-up the magnitude of the increments by which the load was increased systematically to the maximum selected for each week of training. Thus in actual practice less and less of the *per diem* exercise time was devoted to "warming up" contractions. Maximal resistance was increased at weekly intervals.

Appraising the orginal DeLorme procedure, it may be commended on several counts. The dosage of exercise prescribed is greater than that usually used in the clinic. It approximates that deemed obligatory in the training of athletes. The persistent pushing of effort to limits beyond those met easily is also a device common to athletic training. There is no *a priori* reason why the same methods cannot be applied in the treatment of simple disuse atrophy, providing the stress imposed can be tolerated by the bones and joints, and the patient is otherwise healthy. This appears to have been DeLorme's initial view for he concluded that in order to obtain rapid hypertrophy, "the muscle should be subjected to strenuous exercise and at regular intervals to maximum exertion."

In 1948 DeLorme and Watkins reported that further experience had shown that "in most cases" two or three bouts of exercise were "far more satisfactory" than the seven to ten previously advocated, and that furthermore, only one need be pitched to the level of maximal effort. It was recommended that the resistance be adjusted to one-half maximal on the first bout and stepped-up to 75 per cent of full load on the second bout. Thus two-thirds of the daily workout was relegated to "warming up" activity, and the *per diem* dosage of overload exercise was held to only ten repetitive contractions.

As far as we have been able to determine the only evidence in support of this radical modification in the original DeLorme procedure is that supplied by clinical experience. No systematic attempt appears to have been made to test the validity of the sharp diminution in the magnitude of the effort exacted for training purposes. Reasoning from first principles suggests that some point must exist below which reduction in the dosage of exercise defeats the purpose for which it has been administered.

Expediency may have contributed to the downgrading of the work demanded from the disabled person. Under the exigencies of scheduling treatment for large numbers of patients it may have appeared to the hard pressed physical therapist and the responsible clinician that as much was accomplished through application of the automatically graded short-cut procedure as by the original method which not only took more than three times as long to administer, but which also required the exercise of considerable judgment to gauge the limits to which the handicapped person could be pushed with safety each time he presented himself for treatment. It is easy to understand why the stereotyped short method rapidly became the standard practice of most physical therapy departments in this country. By so doing it was forgotten that the method had developed in the hospitals of the armed forces where physical therapy was only a small part of the patient's total treatment program, which often included reconditioning exercises, swimming, sports, manual arts, and occupational therapy. These adjuvants to general rehabilitation are not commonly available in civilian installations.

The "Oxford Technique" is another curious modification of DeLorme's original method of training. In 1951 Zinovieff proposed that the maximal resistance be introduced at the onset of exercise and then reduced systematically, *pari passu* with the development of fatigue, instead of increasing the stress imposed during the

course of each practice session. This is contrary to the whole theory of overload training. Indeed, it violates the basic concept on which overload training is based. We ourselves demonstrated as early as 1946 that the DeLorme 10-RM (ten repetition maximum) could be carried from the onset of exercise and suggested that the "warming up" bouts might thus be eliminated. This would simplify the technic of administering heavy resistance exercise without defeating the purpose of the method if the power developed by the contracting muscles was sustained at the highest possible level in spite of fatigue. Our objective was to carry the 10-RM throughout the entire practice session before upgrading the maximal resistance. This is the only way the human machine can be driven to attain higher and higher peaks of all-out effort. Determination not to reduce the rate of working when the stress imposed seems insuperable is the *sine qua non* of overload training.

The overload principle is as important in the rehabilitation of the disabled as it is in the training of athletes. Restoration of function is possible only if the limits of performance are persistently extended. The rate at which improvement progresses then depends primarily on the degree to which the person is willing to punish himself. There is no short cut, effortless technic of muscle training; and no reason why physiological degrees of fatigue are contraindicated in the orthopedically disabled if cardiovascular-respiratory mechanisms operate normally and general health is unimpaired.

The purpose of this paper is twofold: *First* to present an experimental demonstration of the overload principle. To our best knowledge this has never been done on man. *Second*, to evaluate the efficacy of some of the clinical technics of applying strength developing exercise popularized in the last decade. As indicated previously, the evidence in support of these is almost wholly empiric.

Material and Methods

The subjects of the investigation were all normal young adults. The majority had had experience in vigorous competitive athletics and professional training in physical education. They were thus already inured to the discomforts of severe exercise and knew how to extend the limits of performance by systematic training. Between 1950 and the summer of 1954 observations were made on 17 subjects, 8 male and 9 female. *In toto* 620 experiments were conducted in the course of 7 different training procedures.

TABLE I

Design of the MCV Experiments

Constants: No. contractions per bout, 25; cadence, 2 count rhythm with metronome at 100; duration of bout, ½ min.; rest pause between bouts, ½ min.; extent of contraction, maximal attainable by concentrated volitional effort; end-point of performance, failure to develop enough tension to produce a measurable lift of the assigned load in the prescribed rhythm, or completion of the assigned number of contractions.

Training by the Limit Day Procedure:

1. Begin with a light load (♀ .5 kg., ♂ 1 kg.).
2. Increase load with each successive bout by a predetermined increment (.25 kg. or .5 kg.).
3. Continue to complete exhaustion. Load is the independent variable and this determines the number of bouts to the end-point of performance.

MCV Overload Procedure:

1. Determine pre-training limit day performance on preferred side.
2. Repeat on contralateral side.
3. Compute work done per bout and *graph* against load.
4. From the *curve of work* thus obtained, select the initial training load. This is greater than the optimum but less than the failing load.
5. Train 3 times weekly (M.W.F.).
6. Begin with the preferred side and lift the prescribed load through the fullest possible range 250 times, dividing the work assignment into 10 bouts of 25 contractions each.
7. Repeat on the contralateral side. Both the load carried on any given day and the number of contractions are held constant. The independent variable is the extent of the contraction under the conditions imposed.
8. Compute the work done per bout and graph against time. Assess the magnitude of the stress from the fatigue curve thus obtained. When the decrement in performance is less than 20 to 25 per cent increase the degree of overloading.

MCV Underload Procedure: Exactly like the above except that the load selected falls well in the underload zone and remains constant throughout the training period.

All exercise was performed on the Kelso-Hellebrandt modification of the Mosso ergograph (1948). Observations were limited to wrist flexion or extension. The exercise prescribed was repetitive. It was executed to the rhythm of an audio-visual metronome. The cadence was kept constant throughout the series of experiments. The work assignment was divided into bouts consisting of 25 lifts. Each bout was followed by a rest pause equal in duration to the period of exercise. The number of bouts varied in relation to the degree of overloading.

The design of the individual experiments is presented in tables 1 and 2. In all of these the

TABLE II

Design of the Illinois Experiments

Constants: Same as those in Table I.

Illinois Overload Procedure: Same as MCV with the following exceptions—

1. Train daily, 5 days per week (M.T.W.T.F.).
2. Train only on one side, right or left (R/L).
3. Overload to the maximum (i.e., 25-RM).

Illinois Underload Procedure:

1. Exactly like the above except that one subject carried ½ the 25-RM twice the number of times (500 contractions divided into 20 bouts).
2. Two subjects carried ¼ the 25-RM four times as frequently as in the standard procedure (1,000 contractions daily divided into 40 repetitive bouts).

Ergographic Equivalents of Modified DeLorme Procedures:

1. Two subjects carried the 25-RM for 3 bouts daily instead of 10 (75 contractions instead of 250).
2. Two subjects performed 3 bouts daily instead of 10, but carried 50 per cent of the 25-RM on the first bout, 75 per cent on the second bout, and the full 25-RM only on the last bout.
3. One subject reversed the above procedure. This is the so-called "Oxford Technique." The number of bouts is limited to 3 but the full 25-RM is carried on the first bout, 75 per cent on the second, and 50 per cent on the third.
4. One subject trained strictly in accord with Zinovieff's original "Oxford Technique." Ten bouts were performed daily, beginning with the 25-RM and reducing the load by ¼ kg. with each bout. After each daily work-out, the subject was given a brief rest pause and then attempted to upgrade the 25-RM. Thus the starting load was pushed *daily* to higher and higher levels.

subject had only one objective—to make each repetitive lift against a measured degree of resistance the maximal attainable under the exigencies of the conditions imposed. Thus the study called for highly trained and cooperative subjects, familiar with the disciplined behavior required for controlled laboratory experimentation.

Clinical conditions were simulated in the MCV experiments (Table 1). Training by the limit day procedure is an approximate ergographic equivalent of the original DeLorme technic of heavy resistance exercise. In the overload and underload experiments both groups of subjects performed the same number of contractions; both made an all-out effort. The only difference in procedure was the magnitude of the loading.

In the Illinois overload and underload experiments the total work done by all subjects was comparable since the resistance imposed and the duration of the effort were varied in inverse relation one to the other (Table 2). The independent variable was the rate of working or the power developed by the contracting muscles. Although the total work done in lifting a light load 1,000 times might not exceed significantly that done in lifting a heavy load 250 times, the amount of work done per unit time is vastly different. Thus the conditions of the Illinois experiments were set to permit direct appraisal of the efficacy of the overload principle.

A small group of experiments was also devised to assess the validity of the reduction, for clinical purposes, of the total amount of exercise performed *per diem*. These experiments are also described in table 2.

RESULTS AND THEIR INTERPRETATION

The scope and extent of the experimental data are summarized in table III.

NOTE: The early experiments were performed in the Division of Clinical Research, Baruch Center of Physical Medicine and Rehabilitation, Medical College of Virginia. Luz Maria Lopetegui and Anna Scott Hoye rendered invaluable assistance. The electromyographic equipment was made available through a grant from the Pope Foundation. The technical assistance of Miriam J. Partridge, Ted Y. Okita and Dr. C. Etta Walters is gratefully acknowledged.

TABLE III

Summary of Experimental Data

Type of Training	Wrist Movement	R/L Side	No. of Subjects	No. Days Training	No. Training Days/Week	No. of Experiments
MCV Experiments						
1. Limit Day	Ext	R&L	6	15	5	180
2. Overload	Flex	R&L	4	20	3	160
3. Underload	Flex	R&L	3	20	3	120
ILL. Experiments						
1. Overload	Flex	R/L	4	10	5	40
2. Underload	Flex	R/L	3	10	5	30
3. Short Methods	Ext	R/L	5	15	5	75
4. Oxford Technique	Ext	R	1	15	5	15

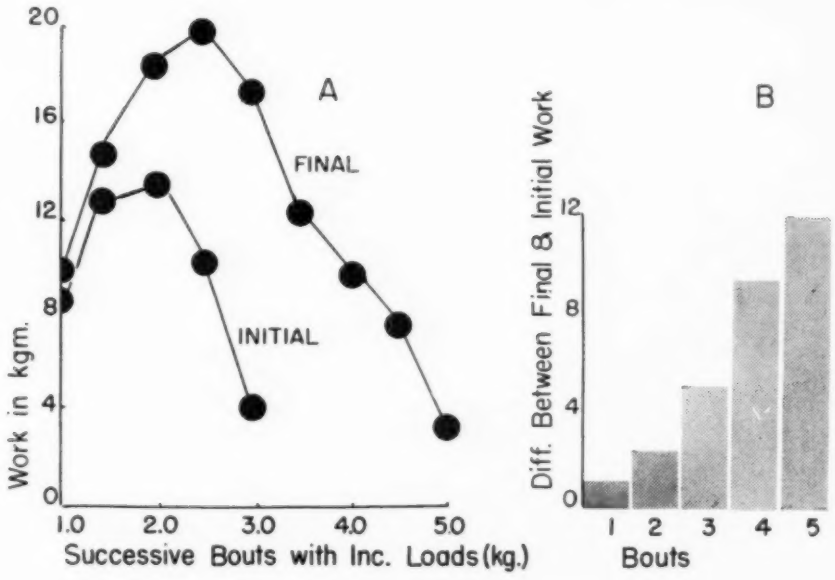

Figure 1

Figure 1-A. Initial and final curve of work of one subject training by the limit day procedure.

Figure 1-B. Column diagram illustrating the magnitude of the difference in performance on successive bouts.

Training by the limit day procedure

The work done per bout in the limit day procedure may be computed and graphed against load. This is known as the *curve of work* (Fig. 1-A). The optimum load is that resistance at which most work is done. Any resistance less than this falls in the underload zone; that greater than the optimum falls in the overload zone. Thus overload is a relative term with a fixed minimal connotation but a variable terminal value.

Overload exercise need not be exhausting. The degree to which fatigue develops varies directly with the magnitude of the stress imposed over and above optimum. The extent of contraction also varies. The greater the overloading the smaller the range of motion.

The influence of six practice periods during which one subject worked against increasing resistance until the load could no longer be lifted the requisite number of times in the prescribed rhythm is shown in the first illustration. Comparison of the initial and final curves of work (Fig. 1-A) indicates a substantial gain in strength, power, and endurance. However, when the absolute difference in initial and final performance on each successive bout is graphed as a column diagram (Fig. 1-B) it may be seen that whereas improvement was comparatively small in the underload bouts, it was larger when the resistance was optimal, and strikingly sharp when the stress imposed exceeded that which could be overcome easily. This fundamentally important point is illustrated in another way in figure 2. Improvement is now expressed in relative terms to make all observations comparable. Here we see the efficacy of overload training simply and clearly demonstrated.

When the limit day procedure is used as a training device a substantial proportion of the total exercise period is wasted in preparatory contractions which may or may not be needed for "warming up" purposes. One-half to two-thirds of the contractions performed require less than maximal tension. It is not surprising, therefore, to find that three weeks of training by the limit day procedure led to only a modest improvement in performance (67.07 per cent).

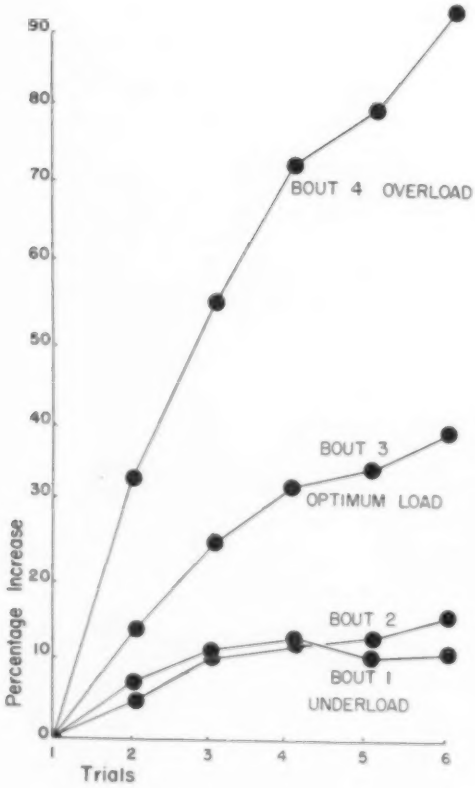

Figure 2. Training curves for each individual limit day bout.

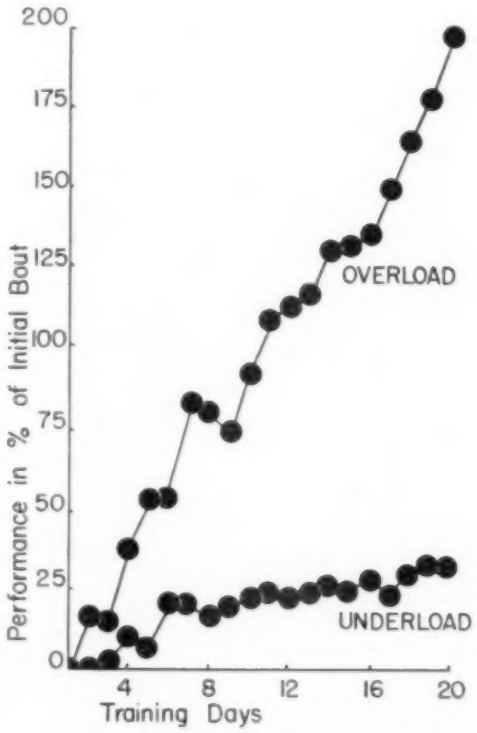

Figure 3. Mean training curves of two groups of subjects performing the same number of contractions *per diem* under different conditions of loading.

Comparison of the influence of overloading and underloading when duration of exercises is constant

Two hundred fifty contractions *per diem* three times a week for eight weeks failed to increase strength more than minimally when the resistance against which tension was developed fell in the underload zone (Fig. 3). The same number of contractions performed against moderate overloading resulted in a dramatic gain in functional capacity (Fig. 3). The tension developed was sufficient at all times to maintain almost full range of motion. Fatigue, therefore, was minimal.

The slope gradient of the training curve rose sharply. The mean gain performance was 188.75 per cent on the right and 208.20 per cent on the left. This is far superior to training by the limit day procedure. It is also well over three times greater than that demonstrated by McMorris' and Elkins' normal subjects who performed a shortened version of the DeLorme or Oxford technics once daily five days a week for twelve weeks. Indeed, the progress made by our subjects training in underload closely parallels that of McMorris and Elkins, albeit on a lower level, when the two are graphed on the same time scale. The Mayo Clinic subjects contracted only 40 times *per diem*, and of these, only 10 contractions were performed against maximal resistance.

Comparison of the influence of overloading and underloading when the duration of exercise is related inversely to the resistance imposed

The Illinois overload and underload experiments differed from the MCV series in two ways.

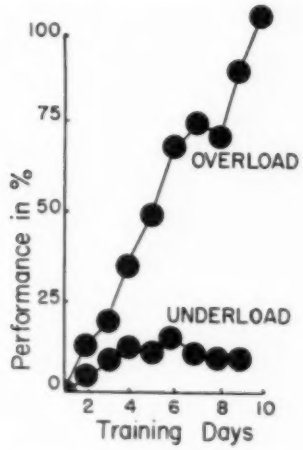

Figure 4. Mean training curves of two groups of subjects performing equivalent total work. The duration of the effort varied inversely with the load.

First, by adjusting the variables of load and duration inversely in relation to an intraindividual criterion of functional capacity (the 25-RM), the total amount of work done *per diem* was held constant. Second, the overload resistance was upgraded to the maximal which could be overcome in 25 repetitions and it was maintained persistently at that level. Performance therefore approached complete exhaustion at the termination of the 10 bout practice sessions. The objective was to push overloading to the highest level tolerated without the development of adverse symptoms.

Since it required only 30 seconds to execute each bout of 25 repetitive contractions, the total demand on the neuromuscular system was 5 minutes of maximal effort *per diem* against maximal resistance. At the end of the practice session the muscle group primarily involved was invariably tense, painful, and swollen. Approximately one hour elapsed before the swelling and discomfort subsided. Recovery was always complete in 24 hours. An incapacitating degree of muscle soreness never developed. This brief intense exercise (250 contractions in ten bouts) against maximal resistance, repeated daily for two weeks, yielded remarkable increases in functional capacity (Fig. 4). One well developed highly trained subject gained 161 per cent in ten practice sessions.

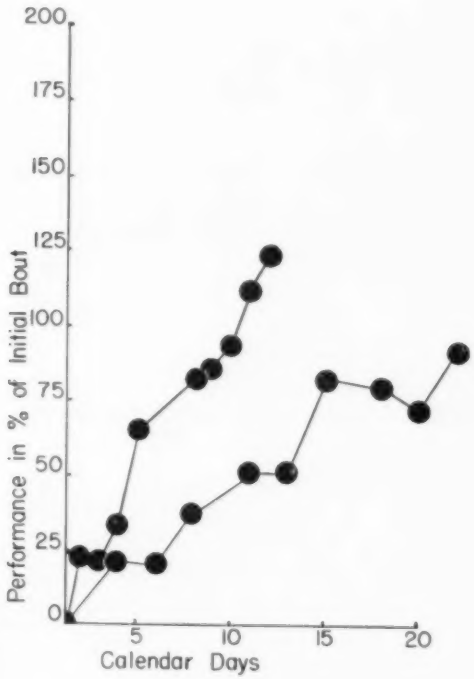

Figure 5. The influence of variations in the frequency of practice and the degree of overloading on the slope gradient of the training curve.

The slope gradient of the mean training curve is practically identical with that of the first overload experiment (Fig. 3). However, since as much was gained in twelve days in the Illinois experiments as in twenty-two days in the MCV experiments the gradient of improvement was significantly greater in the former. This may be demonstrated by graphing work output against time instead of training days (Fig. 5). There is no way of discerning from the evidence at hand whether training was accelerated in the Illinois experiments because of the greater frequency of practice, the greater degree of overloading, or both.

When the resistance was reduced to one-half 25-RM and the duration of exercise was doubled (500 contractions in 20 bouts), the gain in performance was negligible (9.88 per cent). When the resistance was dropped to one-quarter 25-RM and exercise time was quadrupled (20 minutes)

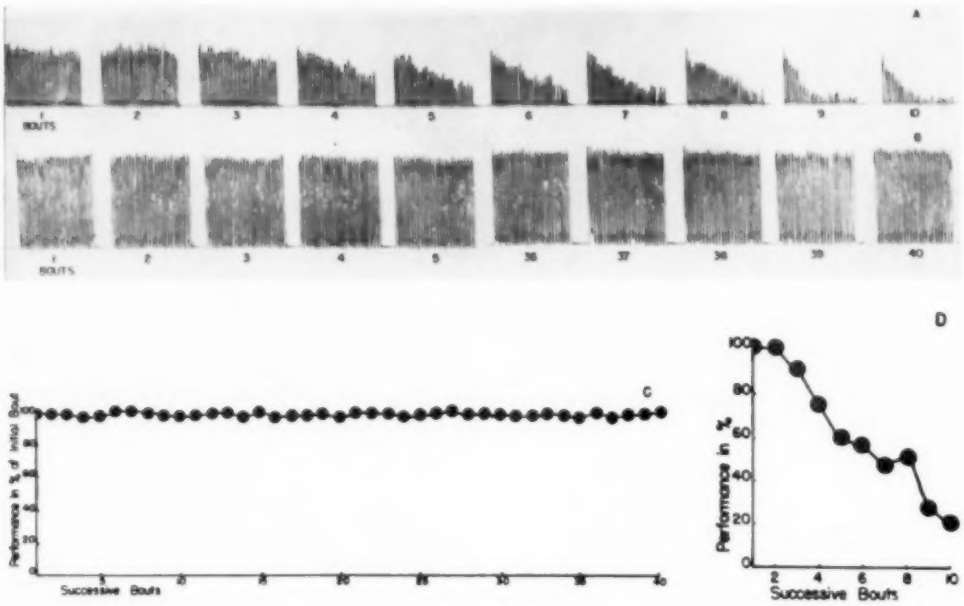

Figure 6.

Figure 6-A. Typical ergograms of one subject performing ten bouts of repetitive exercise in overload (25-RM).

Figure 6-B. First and last five ergograms of one subject performing forty bouts of repetitive exercise in underload (¼ 25-RM).

Figure 6-C. Numerical data for the underload experiment demonstrating that there is no evidence of fatigue in the course of 1,000 repetitive contractions.

Figure 6-D. Numerical data confirming decrement in performance during overload exercise illustrated in Figure 6-A.

there was little change in work output (Fig. 4). One thousand repetitive contractions *per diem* (40 bouts) had virtually no effect on muscle strength. The slight increase in functional capacity with training was due to the extensive mobilization of the wrist joint. This increased the range of motion and hence the height to which the assigned load could be lifted. Thus performance was augumented for physical reasons, since work is the product of the load and the distance through which it has moved, rather than change in the contractile mechanism *per se*.

One subject was eliminated from the Illinois overload training curve because of persistent inability to gauge total capacity and distribute strength potential over the number of contractions assigned *per diem* (250). There was minimal evidence of fatigue for 3 or 4 successive bouts, after which the load selected could not be raised through full range for more than a few strokes per bout. The ability to develop tension then dropped precipitously. The ergograms of the terminal bouts were erratic and feeble in spite of exhortation to supreme effort. Although the subject continued to contract isometrically until the full 250 lifts had been attempted, performance improved only 56 per cent in three weeks of diligent training. This suggests that overloading which is so extreme that the extent of shortening is curtailed is less effective than training with lesser degrees of stress.

In 1944 Eccles presented evidence indicating that disuse atrophy is best counteracted by allowing muscles to shorten during their contraction. He considered both range of motion and the alternation of lengthening and shortening which occur in natural movements to be important. In an earlier work (1941) he had pointed out that

a few powerful voluntary contractions per day would probably be sufficient to prevent any large disuse or immobilization atrophy. Whether there is a limit beyond which the number and/or extent of contractions cannot be reduced without jeopardizing the success of the treatment is a question which remains yet to be answered. Another point frequently overlooked is whether powerful voluntary contraction is possible through exercise of the will if no resistance to movement is provided. The Illinois overload-underload experiments suggest that the development of maximal tension is absolutely dependent on the imposition of maximal resistance.

Typical overload and underload ergograms are presented (Fig. 6-A and 6-B). It is remarkable that attention can be mobilized so effectively that 1,000 repetitive contractions could be performed in a single practice session without any sign of fatigue (Fig. 6-C). In contrast the decadence in performance was profound when the stress imposed approximated the maximum which could be tolerated under the conditions of the overload experiments (Fig. 6-D). Fatigue of this magnitude is indicative of maximum exertion. It cannot be simulated by the malingerer. It never occurs in underload exercise. In our experience it is a reliable indicator of the type of performance needed to augment the ability to develop and sustain high levels of tension.

Maximal contraction against maximal resistance is accompanied by overt changes in the positioning of parts of the body far removed from the exercising appendage (Fig. 7). Lesser variations in muscle tension may be recorded electromyographically (Fig. 8). They are never haphazard. On the contrary the responses elicited reflexly appear to be definitely patterned and highly repeatable. We have described elsewhere* the influence on the positioning of the head of the proprioceptive barrage emanating from the limbs during heavy resistance exercise in man. The tonic neck reflexes thus secondarily elicited facilitate to a high degree, augmenting the functional capacity of the limb musculature. No such neuromuscular irradiation accompanies underload exercise. Devoid of significant feedback stimulation during such activity the central nervous system appears to be incapable of increasing the flow of impulses descending from the motor cortex sufficiently to develop maximum tension.

* See reference 16.

Figure 7. Line drawing of one of a series of photographs taken during wrist flexion against maximal resistance, illustrating involuntary changes in the alignment of the head, neck, shoulder girdle, vertebral column and non-participating extremities.

Assessing the validity of currently popular technics of applying heavy resistance exercise for the development of strength

Simple reduction of overload exercise to 3 instead of 10 bouts was associated with a mean increase in performance of 33.35 per cent in 15 training days (Fig. 9-A). This value falls far short of the gains recorded by the subjects who pushed performance to 10 full bouts, carrying the 25-RM throughout the exercise period (Fig. 4).

Simulation of the DeLorme-Watkins short method by adjusting the ergographic load to 50, 75, and 100 per cent of the 25-RM had virtually no effect on performance (Fig. 9-B). Reversal of this procedure, the so-called "Oxford Technique," likewise produced negligible changes in functional capacity (Fig. 9-C).

In our hands a downgrading of the severity

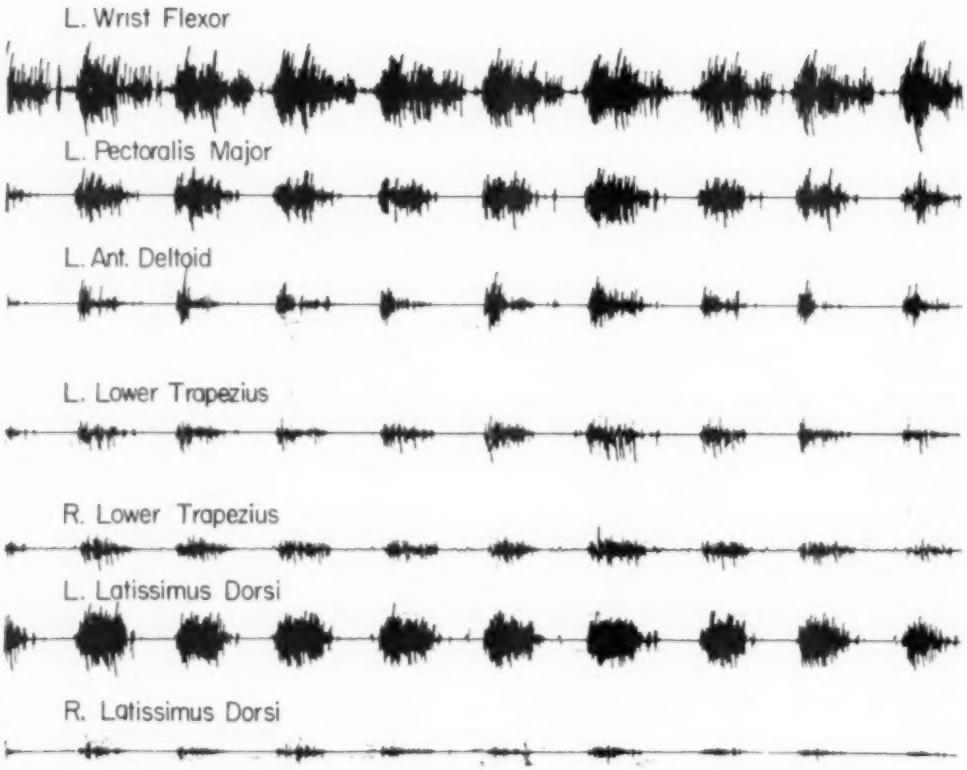

Figure 8. Electromyograms illustrating the degree of reflex activity evoked by repetitive volitional flexion of the left wrist against heavy resistance.

of the ergographic work assignment by an amount equivalent to that introduced clinically by DeLorme and Watkins did not prove superior to the more protracted exercise. Indeed, our evidence suggests that the living machine operates under such wide margins of safety that it is difficult to deplete hidden reserves of power in short periods of exercise consisting of small numbers of contractions. Thus stress is never introduced. A controlled experiment could be designed which would present direct evidence on this point under routine clinical conditions. It would seem important that this be done before physical therapists adopt the short-cut method as the preferred technic.

The "Oxford Technique" embraces two modifications of DeLorme's original procedure, one of which appears to have been generally overlooked. As previously described, the heaviest load is introduced at the onset of the practice session and is then reduced systematically to offset such fatigue as might develop. Having performed the work assignment the patient attempts to increase his 10-RM by a constant increment daily. If the patient is successful, the new 10-RM is used as the starting resistance for the next day's exercise session which consists of 100 lifts in ten successive bouts. This is a vastly different procedure from the one with which the term "Oxford Technique" is usually associated. It is highly probable that the daily building up of maximal resistance might keep the degree of overloading pitched to a sufficiently high level to nullify the influence of decreasing the load in order to prevent the development of stress. The two modifications in procedure introduced by Zinovieff are therefore physiologically antithetic. Thus the "Oxford Technique" should be neither better

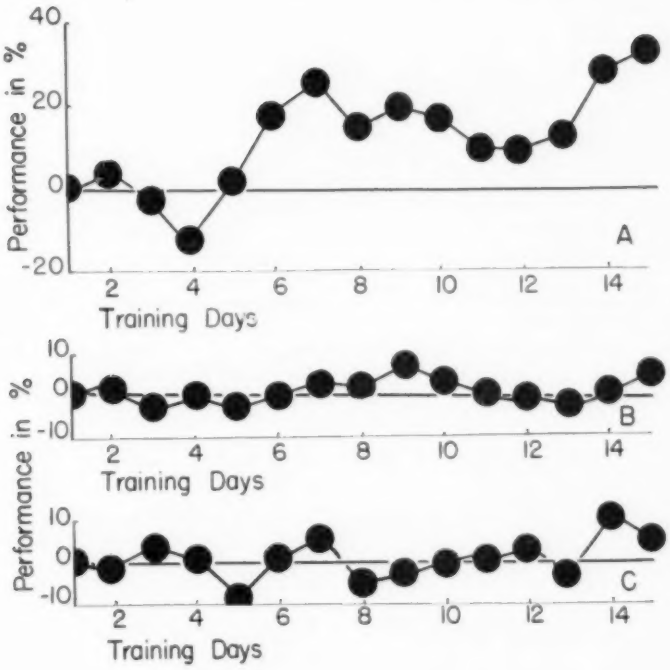

Figure 9.

Figure 9-A. Mean training curve of two subjects carrying the 25-RM for three successive bouts per practice session.

Figure 9-B. Mean training curve of two subjects performing three successive bouts per practice session carrying ½, ¾ and the full 25-RM.

Figure 9-C. Training curve of one subject performing three successive bouts per practice session carrying 100 per cent, 75 per cent and 50 per cent of the 25-RM.

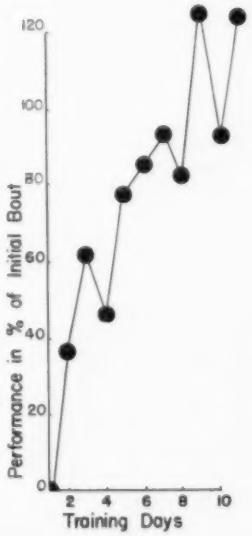

Figure 10.

Figure 10 (Right). **Training curve of one subject exercising in accord with Zinovieff's "Oxford Technique."**

nor less effective than the original DeLorme procedure.

One subject exercised strictly in accord with the recommendations of Zinovieff. The ergographic equivalent of this procedure is described in table 2. Improvement in performance was prompt and dramatic (Fig. 10). It had reached 124.61 per cent by the ninth day of training. Beyond that point the daily increase in the 25-RM made the exercise so severe that total work output began to decline. The experiment was terminated on the eleventh day at which time the number of kilogram-meters of work done in 250 repetitive contractions exceeded initial performance by 123.36 per cent.

COMMENT

Siebert demonstrated in animal experiments that the mere repetition of prevailing performance does not lead to the hypertrophy of skeletal muscles. Hypertrophy appears only when the rate of working is increased. Power is the decisive factor, not the total amount of work done.

Christensen found that the limits of adaptation of the heart in man can be extended only by continually increasing the intensity of the work, not by the performance of work of uniform intensity throughout the period of training. Stress apparently releases compensatory mechanisms which augment the functional capacity of any organ system.

Little has been said thus far about the nature of the changes occurring in the machinery of the human body by virtue of which the ability to perform work is enhanced. The rapidity with which overload stress increases the capacity for severe exercise suggests that this must be due in large measure to changes in the central nervous system related to motor learning. It cannot be due, initially at any rate, to alterations in anatomical structure.

Almost no attention has been directed at differentiating the functional from the morphological concomitants of therapeutic exercise. It is of signal importance to appreciate that the performance of purposive movements is a neuromuscular act, and that of the two components, the one concerned with the evoking of appropriate volitional impulses must be primary. Too much attention has been focused on the contractile tissue and not enough on the mechanisms which drive the skeletal musculature.

When muscle is required to perform heavy work for a protracted interval of time it increases in volume. Although the cause of this change has not yet been proven unequivocally, it is generally conceded to be due to the hypertrophy of existent fibers rather than an increase in their number (Adams *et al.*). Strength and endurance augment proportionally with physiologic hypertrophy, but these qualities of performance depend also on changes evolving concurrently in the central nervous system.

Proprioceptive excitation and inhibition modulate the innervation of muscle autonomously. Granit in particular has emphasized the reflex self-regulation of muscle contraction. Autogenetic inhibition serves as a "governor" of the innervation and protects the muscle against the development of traumatizing degrees of tension. Inhibition of central origin provides another line of defense. Thus voluntary contraction is essentially self-limiting, at least in the normal adult working under the conditions operating in the experiments herein reported. The imposition of heavy resistance apparently functions as a braking device which activates servo-mechanisms that keep performance within the tolerance limits of the contractile tissues. The evidence suggests that normal muscle cannot be harmed by volitional effort when range of motion and cadence are controlled. In our experience overloading *per se* is incapable of damage to the integrity of the normal muscle fiber, when the stress imposed consists of increases in resistance which must be overcome volitionally.

SUMMARY AND CONCLUSIONS

The end-results of many orthopedic procedures are affected significantly by measures introduced postoperatively to prevent or alleviate disuse atrophy of skeletal muscles. To elucidate the mechanisms of muscle training in man 620 experiments were performed on 17 normal adult subjects. The evidence presented supports the following conclusions: *First*, strength and endurance increase when repetitive exercise is performed against heavy resistance. *Second*, the slope gradient of the training curve varies with the magnitude of the stress imposed, the frequency of the practice sessions, and the duration of the overload effort. *Third*, mere repetition of contractions which place no stress on the neuromuscular system has little effect on the functional capacity of the skeletal muscles. *Fourth*, the amount of work done per unit time is the critical variable on which extension of the limits of performance depends. *Fifth*, the speed with which functional capacity increases suggests that central nervous system changes contribute an

important component to training. *Sixth*, the ability to develop maximal tension appears to be dependent on the proprioceptive facilitation with which overloading is associated. *Seventh*, no evidence was forthcoming in support of the validity of currently popular technics of administering progressive resistance exercise clinically.

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Examination for Physical Therapy Licensure in Pennsylvania

The State Board of Medical Education and Licensure of the Commonwealth of Pennsylvania announces that its next examination for physical therapy licensure will be given in both Philadelphia and Pittsburgh on July 9 and 10, 1956. Application for the examination should be made as soon as possible to:

Department of Public Instruction
Bureau of Professional Licensing
State Board of Medical Education and Licensure
Box #911, Harrisburg, Pennsylvania

The Role of the Physical Therapist in the Diagnosis of Peripheral Vascular Diseases

Morris Vogel, B.S., Lawrence Weinstein, B.S., Arthur S. Abramson, M.D., and Alfred Ebel, M.D.

Introduction

The term *peripheral vascular disease* does not refer to a single clinical entity although it is often used in that way. It is a generic term which includes within its meaning a wide variety of conditions in which there are disturbances of circulation in the limbs. In its broadest sense it applies to diseases of any of the blood vessels outside the heart, and includes diseases of the lymphatics as well. It is usually manifested by a temporary or permanent interference with blood flow in the extremities.

The conditions which a therapist is most likely to see in a busy physical therapy clinic of a large medical center fall into three classes:

I. *Arterial diseases*, which may be classified as organic arterial obstruction and functional arterial obstruction. The former may be classified as acute organic obstructions and chronic organic obstructions. In the acute forms there are such etiologic factors as embolism, acute thrombosis, and trauma. The chronic forms include arteriosclerosis obliterans and thromboangiitis obliterans (Buerger's disease). In the functional arterial obstructions, which are on a vasospastic basis, such conditions as Raynaud's disease, traumatic arterial spasm, and reflex arterial spasm due to increased constrictor tone are encountered. Combined organic and functional obstruction is most frequently seen in thromboangiitis obliterans, Raynaud's disease and frostbite. It is in the management of these diseases that the physical therapist is most frequently called upon to perform various diagnostic procedures which will be described in detail.

II. *Venous diseases*, which deal with inadequate return of blood. In this group we encounter such clinical entities as thrombophlebitis, phlebothrombosis, varicose veins and their complications. Diagnostically, in these conditions, the physical therapist plays a relatively minor role since the diagnosis is made almost entirely on the history and physical examination done by the physician.

III. *Diseases of lymphatics*, which include such conditions as lymphangitis and lymphedema. While the physical therapist's role is primarily a therapeutic one, volumetric determinations may be requested in these lymphatic disorders for the purpose of determining differences in size of the limbs.

The above classification of peripheral vascular diseases does not cover the entire scope of circulatory disturbances; it is merely a general outline of the major disorders most commonly encountered. Many volumes have been written on peripheral vascular diseases intended for the use of physicians. These delve deeply into the pathology and physiology of circulatory disorders. Little has been written which will assist the physical therapist in dealing with these problems. It is felt that the outline presented here should enable him to perform the various diagnostic procedures intelligently.

Among the numerous test modalities which are employed for the diagnosis of peripheral vascular disorders are the following:

1. Skin Temperature
2. Oscillometric Index
3. Reactive Hyperemia
4. Histamine Flare
5. Landis-Gibbons Test
6. Environmental Temperature Studies
7. Sweat Test
8. Skin Resistance Measurements
9. Posterior Tibial Block
10. Cold Sensitivity Test
11. Volumetric Determinations

While the physician performs many of these tests in the course of the physical examination,

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the physical therapist is frequently called upon to assist the physician in the performance of some of these procedures. It is therefore important that he have some knowledge and understanding of these technics and their rationale.

The objective of this paper is to describe the purpose and physiologic basis, equipment and technic for the tests listed. While this material is not original, the amount of research required to gather this information indicated to the authors the need for making it readily available to physical therapists for reference purposes.

SKIN TEMPERATURE

The temperature of the skin is directly related to the amount of blood circulating through it. With maximum vasodilatation, maximum heat is given off by the body. When conservation of heat is essential, the blood vessels constrict, the amount of blood flow is diminished and the skin becomes cooler. In peripheral vascular diseases the observation of skin temperatures is one of the simplest and most important diagnostic tests. Readings are usually taken at the tips of fingers and toes, dorsal and volar surfaces of the hands and wrists, dorsal and plantar surfaces of feet, the ankles and any other area indicated.

To record skin temperature accurately various means are employed, ranging from the inexpensive skin thermometer to highly complicated electronic recording devices. Skin thermometers have the disadvantage of responding slowly and are therefore time consuming. For most efficient clinical application, use of one of the direct reading thermocouples or thermistors is advisable.

OSCILLOMETRIC INDEX

Purpose — To determine the expansile impulse of the blood vessels in a segment of a limb during systole.

Physiologic Basis — When considering the nature of blood flow through the peripheral arteries, it is important to recall that with each cardiac systole there is a sudden thrust of blood into the peripheral arterial tree, which produces an increase in the volume of the extremity. This volume increase is transient and disappears during diastole. These changes in the volume of the extremity are not visible to the naked eye. Where larger arteries are present, such as in the thigh, the volume of the limb at that level will be proportionately greater than in areas where smaller arteries are present. Where the lumen of an artery is narrowed, the volume increase of the extremity during systole will be proportionately diminished; however, an oscillometric index of zero is not conclusive evidence of complete impairment of circulation in an extremity. The presence of collateral blood vessels, which are muscular in structure, and possess negligible elastic qualities, may supply the limb with arterial blood. Because of the nonelastic quality of these collateral vessels they are not palpable and the flow of blood through them does not register on the oscillometer. Therefore, clinically, we may see an extremity which is warm and without abnormal color changes even in the presence of organic occlusive disease of the main peripheral arteries and in the absence of palpable pulses. The readings taken on an edematous extremity may not be valid.

Equipment and Technic — oscillometer

1. Patient should be in the supine position and relaxed.

2. Room temperature should be comfortable (75° F.)

3. In studying the lower extremities, the cuff is applied snugly around the segment being tested, always avoiding bony prominences.

4. The cuff is inflated to a level of approximately 50 millimeters Hg above the patient's systolic blood pressure.

5. A button or lever will temporarily establish continuity between the air in the cuff and in the aneroid pressure recorder resulting in an excursion of the needle on the oscillometer scale with each systole. The pressure in the cuff is then reduced by 10 millimeters Hg and another reading is taken, by again activating the button or lever.

6. This procedure is repeated at 10 millimeter Hg intervals, noting each time the amplitude of the excursion of the needle. This is continued down to diastolic pressure.

7. The pressure at which maximum oscillation occurs is noted; at this point the difference between the maximum and minimum readings is observed on the oscillometer scale, and this difference is called the Oscillometric Index.

8. Readings in the lower extremity may be taken at a point above the knee, below the knee, above the ankle, and if desired, over the foot.

9. To obtain oscillometric indices in the upper extremity, the cuff is applied to the following parts: mid arm, forearm, above the wrist and across the palm of the hand.

REACTIVE HYPEREMIA

Purpose and Physiologic Basis — Occlusion of the circulation of an extremity by means of a blood pressure cuff prevents removal of metabolites from the tissues. These metabolites, such as CO_2 and lactic acid, accumulate locally during the period of tourniquet application. Following release of the tourniquet these accumulated metabolites, which are potent chemical vasodilators, allow the peripheral vascular bed to be completely filled with blood producing a skin flush (reactive hyperemia). Of course, an adequate inflow of blood must be available to fill the dilated vascular channels. When arterial disease is present the hyperemia may be delayed up to 2 minutes, or it may appear faint, purplish, or as a patchy redness and with uneven distribution.

Technic

1. Patient is recumbent in a warm room.

2. The arterial blood supply is arrested by the application of a blood pressure cuff above the knee, inflated to above systolic level while the leg is elevated. The leg is then lowered and after 10 minutes the pressure is released allowing blood to rush into the leg and hyperemia to occur equally over the entire leg below the cuff. Hyperemia reaches a maximum in 10 seconds in a normal extremity. In a limb with impaired circulation the "flush" may be incomplete or entirely lacking.

HISTAMINE FLARE TESTS

Purpose and Physiologic Basis — In persons with normal arterial circulation, the reactions to intracutaneous histamine inoculation are as follows:

1. A wide zone of erythema or "flare" appearing about the inoculation site due to relaxation of the arterioles.

2. A more local dilatation of the capillaries at the site of the inoculation.

3. Development of a wheal due to the outpouring of plasma from the locally dilated and permeable capillaries.

The wheal begins in about 2½ minutes, is fairly well developed in 5 minutes and should be complete within 10 minutes. The wheal is the main feature of the test. The flare may behave similar to the wheal or it may be delayed or lacking. Itching is present.

In patients who present clinical evidence of impaired arterial circulation, whether due to thromboangiitis obliterans, embolism, or inflammation, the reactions to the inoculation with histamine are defective in that a complete wheal and flare fail to develop within the 10 minute period.

Technic — A 1:1000 solution of histamine acid phosphate is employed. The patient is relaxed in a warm, well lighted room. A drop of histamine solution is placed at the following levels: the dorsum of foot; the lateral surface of the leg 3 inches above the ankle; the lateral surface of the leg 3 inches below knee, and the thigh 2 inches above the patella. Multiple inoculations are made over these drops by pricking the area with a fine needle, penetrating the skin carefully to avoid drawing blood. Observations are made at 2½, 5, and 10 minutes afterward. Development of the wheal and flare zone of erythema are noted and recorded.

Lack of normal reaction time and reactions indicate some arterial impairment. In vasospastic disease, however, the test may reveal only delay in capillary response, which may be normal at the end of the 10 minute period.

It is believed that the test is not sufficiently reliable or accurate for determination of improvement or progressive impairment of circulation, and since other and simpler methods are available this test is infrequently used.

LANDIS-GIBBONS TEST

Purpose — To determine the presence of arterial insufficiency, if any, and the degree to which this is caused by organic obstruction or vasospasm.

Physiologic Basis — The body maintains its thermal stability by balancing heat loss against heat production. Application of heat to the body to a degree sufficient to threaten its thermal level is counteracted by peripheral vasodilatation, and consequent heat loss through the skin. By immersing either the upper or lower extremities in water of approximately 114° F., the blood in these extremities is heated. Upon reaching the thermoregulatory center, impulses are transmitted to the vasomotor center in the hypothalamus causing inhibition of vasoconstrictor stimuli to the peripheral vessels of the skin and leading to vasodilatation in the nonimmersed limbs.

Equipment and Technic — The Landis-Gibbons test should be performed at a constant temperature of between 68° F. and 70° F. The equipment needed for this procedure is as follows: a whirlpool apparatus or similar water tank, three

woolen blankets, three sheets, several bath towels, an oral clinical thermometer and a skin thermocouple.

1. The patient is required to undress completely and remain exposed to the room temperature for approximately 30 minutes prior to the start of the test.

2. Following this 30 minute stabilization period, the patient's oral temperature is taken and recorded.

3. Skin temperatures are taken at the following sites: at the bases of the nails, the plantar surfaces of the feet, the dorsal surfaces of the feet, and an area approximately one inch above the malleoli. To insure accurate skin temperature measurements, care must be exercised to avoid those areas on the toes, feet, and legs which are calloused, scarred, gangrenous, or moist, since readings under these conditions are subject to error. Perspiration of the feet should be noted, since its presence may produce cooling of the skin through evaporation.

4. The tank is filled with water of 114° F. The patient's trunk and thighs are securely wrapped in the three sheets and three blankets, and the head and shoulders are covered with bath towels. These coverings, extending from the head to an area above the ankles, prevent loss of heat by radiation from the skin and by evaporation of perspiration. The feet are kept separated and completely exposed to the room temperature.

5. The preparation of the patient described above may be done in one of two ways. The patient may be placed on a plinth in a prone position, or in an upright position standing on the floor. In the former method, the patient remains in a prone position on the treatment plinth, is wrapped in the sheets and blankets, and then submerges his arms into the tank of hot water, which is adjacent to the plinth. The patient's shoulders and head are covered with several bath towels. A piece of wood 2 inches by 2 inches, and 6 inches longer than the width of the whirlpool tank, wrapped with several bath towels to make it soft and comfortable, is used as a headrest for the patient during the test. In the latter method, after the patient is prepared with the blankets and sheets, he is seated on a chair with his feet placed on a small stool and his arms are submerged in the whirlpool tank. The exposed areas of the shoulders and head are then covered as described. Both methods are medically acceptable, but it is felt that placing the patient on a plinth makes testing easier for the physical therapist. If, however, there is some medical reason for the patient's inability to assume a prone position, the alternate method is acceptable.

6. In both methods, the patient's upper extremities are kept submerged until a 2° F. oral temperature rise has been attained. This is determined by checking the oral temperature at 10 minute intervals.

7. The entire procedure should be permitted to last a minimum of 30 minutes to attain the desired oral temperature rise, but not more than 45 minutes, after which time the extremities are removed from the water and dried.

8. Skin temperature readings at the various areas described in step 3 are repeated.

9. The patient is now allowed to cool gradually by slowly removing the coverings and raising the room temperature.

To determine the presence of arterial insufficiency in the upper extremities, the Landis-Gibbons procedure described is the same with the exception that the lower extremities are the ones submerged in hot water and temperature readings of the fingers, hands, and wrists are taken. This procedure often is referred to as a "Reverse Landis-Gibbons Test."

Since this test is frequently administered to elderly and debilitated patients, certain precautions must always be taken. The patient must be under constant supervision since the test increases the systemic temperature, and there may be a tendency for the patient to complain of dizziness, nausea, and dyspnea. If any of these symptoms are observed the test should be discontinued immediately and appropriate measures taken.

The simplicity of the Landis-Gibbons test favors its use as a preliminary procedure in the study of cases showing clinical evidence of peripheral vascular disease.

ENVIRONMENTAL TEMPERATURE STUDIES

Purpose — To evaluate the degree of reflex vasoconstriction in the extremities by a comfortable, simple, and atraumatic method, capable of standardization. Also for the purpose of judging the probable success of a sympathectomy.

Physiologic Basis — Peripheral blood flow is affected by the temperature of the environment to which the skin is exposed: that is, if an extremity is exposed to a warm environment, vasodilatation will occur in an attempt to dissipate excess heat; and conversely, if it is exposed to a cool temperature, vasoconstriction occurs in an attempt to prevent heat loss. This thermoregulatory phenomenon occurs maximally in the absence of organic arterial occlusive disease. Environmental

temperature study is an attempt to evaluate the degree of reflex arterial vasoconstriction, and consists of a comparative study of skin temperature in a warm environment and then in a cool one. The temperature range is narrow enough to avoid too great an inhibition of vasoconstriction and also an extreme degree of vasoconstriction. The objective is to employ mild stimuli in each direction so that individual variations in vasoconstrictor activity will be apparent. Peripheral digital blood flow is estimated in each extremity by means of digit surface temperature readings. The environmental temperatures selected are 83° F. and 68° F.

Equipment and Technic

1. Temperature controlled room
2. Skin thermocouple
3. Wool blanket

The warm room studies are carried out after the patient (at rest, undressed except for a blanket over the abdomen) has been exposed to a constant temperature room of 83° F. for one hour. The cool room studies are carried out under similar circumstances after one hour at a constant room temperature of 68° F. Skin temperature readings are taken at the tips of the digits, the dorsum of the feet, the plantar surface of the feet, and above the ankles following exposure to the 83° F. and 68° F. temperatures described.

SWEAT TEST

Purpose — To determine the success and effectiveness of surgical sympathectomies.

Physiologic Basis — The sweat glands which are present in the cutaneous surfaces of the body are simple convoluted tubules which secrete a solution composed of 99.5 per cent H_2O and 0.5 per cent solids consisting largely of NaCL, urea, and lactic acid.

The sympathetic nervous system, a part of the autonomic nervous system, innervates the sweat glands. Following sympathectomy, which is usually done in an attempt to relieve vasospasm, sweating ceases in the area which has been denervated. This phenomenon is utilized as a simple method for determining the extent and effectiveness of a sympathectomy.

Technic — Prior to the test the patient is given one gram (three tablets) of aspirin with one or two glasses of water. The area to be tested is then thoroughly cleansed and dried and is painted with a solution of the following composition:

For one liter of solution —
215 cc of 7 per cent iodine.
100 cc of castor oil.
685 cc of 95 per cent alcohol.

The area painted is allowed to dry and is then dusted with corn starch. Following this procedure the patient is placed in an electric cabinet bath until he perspires freely. The moisture of the sweat produces an iodine-starch reaction and the starch turns to a blue-black color. The resultant pattern is then charted on an anatomical figure in the appropriate areas.

SKIN RESISTANCE MEASUREMENTS

Purpose — This is an objective method of localizing and interpreting lesions of the sympathetic nervous system.

Physiologic Basis — The term "electrical skin resistance" is used because it has been shown that resistance is localized entirely to the skin itself, the interior of the body being a good conductor.

The electrical method used for determining the effect of a sympathectomy is based on the fact that the resistance between two skin electrodes varies with the amount of sweat gland activity occurring in the skin under the exploring electrode.

Because of the NaCL content, sweat is an electrolytic solution and thus is a good conductor of electricity. In the absence of sweating the resistance to the flow of current is markedly increased due to the lack of a conducting medium in the skin.

In peripheral vascular disease this test is used to determine the effectiveness of paravertebral blocks and of lumbar and preganglionic thoracic sympathectomies. A rise in skin temperature following a lumbar paravertebral block, or the presence of a Horner's syndrome in the case of a stellate ganglion block, are definite evidence of the technical adequacy of the blocks. However in the absence of a temperature increase following a lumbar block it is impossible to determine whether the lack of temperature rise is the result of obstructive vascular disease or is due to a technically inadequate block. The finding of a high skin resistance caused by sympathetic paralysis of the sweat glands is proof of a technically satisfactory block and therefore leads to the conclusion that the lack of temperature response is the result of occlusive vascular disease. By the same token, this procedure can be used in the case of a preganglionic thoracic sympathectomy since this surgical procedure does not produce a Horner's syndrome.

Equipment and Technic

The patient is placed in a moderately warm room. An ohm-meter, such as the Simpson Model 260 is employed. An indifferent electrode with a saline moistened pad is placed over a normally innervated part of the body, usually the upper back. The exploring electrode, which consists of an unpadded metallic disc attached to an insulated handle, is used to map the demarcation zone between high and low resistances in the skin. The former will show skin resistances ranging from 1 million ohms to infinity, whereas the normally innervated skin will show readings between 5,000 and 200,000 ohms. It is not necessary to measure the absolute resistances of sympathectomized skin, but merely to demonstrate adequately the boundary zone between the denervated and the contiguous normal skin. There will be a tendency for the boundary zones to follow the dermatomes of Foerster.

POSTERIOR TIBIAL BLOCK

Occasionally a patient will not be able to tolerate a Landis-Gibbons test because of general debility, heart disease or respiratory difficulties; or a patient may refuse consent for a paravertebral block. There also have been many instances where patients have had such high degree of vasomotor tone that the stimulus for vasodilatation produced by the Landis-Gibbons test was inadequate to release the vascular spasm. In all of these instances the physician may do a posterior tibial block. Between 5 to 10 cc of 2 per cent procaine solution is injected into the posterior tibial nerve at a point just posterior to the medial malleolous. The injection is given after the patient has been exposed to a constant temperature environment of 70° F. for a period of time sufficient to permit stabilization of toe temperatures.

Since the posterior tibial nerve is a mixed nerve containing motor, sensory, and sympathetic fibers, a technically effective block will produce paralysis of the intrinsic muscles of the foot, anesthesia of the entire sole of the foot including the tips of the toes, and paralysis of the sympathetic vasomotor fibers. Anesthesia of the sole of the foot is used as a criterion for the technical effectiveness of the block. Following completion of the block, temperature readings at the tips of the toes are taken at 10 to 15 minute intervals. Temperature readings are continued until equilibrium has been reached following complete anesthesia.

COLD SENSITIVITY TEST

Purpose — To duplicate clinically the signs and symptoms of such vasospastic conditions as Raynaud's disease and scleroderma by creating an environment similar to the one which usually induces an acute attack.

Physiologic Basis — Exposure of the hands or feet to cold of 50° to 55° F. acts as a stimulus causing an initial vasoconstriction of the blood vessels locally, with a significant decrease in the rate of peripheral blood flow. In an extremity subjected to the influence of local cold by immersion in ice water, the skin temperature falls. Associated with the diminished blood flow are definite color changes in the skin characterized by pallor and cyanosis. As a result of this temporary ischemia, carbon dioxide, lactic acid, and other products of metabolism, accumulate locally in the deoxygenated blood. Upon removal of the cold stimulus, these metabolites, which are chemical vasodilators, cause vasodilatation of the small blood vessels with a resultant erythema of the exposed areas. In vasospastic conditions, such as Raynaud's disease, an attack is manifested by acute and temporary closure of the small arteries, which causes discoloration of the affected parts. A common mistake to be avoided is overcooling the digits of the hands and feet to temperatures below 50° F. This usually fails to induce an attack because at such temperatures the minute cutaneous vessels dilate, the dissociation of oxyhemaglobin ceases, and there is a conspicuous after-reaction with dilatation of the arterioles and opening of the arteriovenous anastomoses, so that the characteristic color changes of an attack are not observed.

Equipment and Technic

1. A basin of sufficient size and depth to accomodate both feet or hands.

2. A water thermometer capable of recording temperatures of at least 50° F.

Prior to immersing the hands or feet, their color is observed. If there is pallor or cyanosis present, there is no need for performing the test. However, if there are no color changes observed, the parts being tested are submerged in a basin of ice and water, which has been adjusted to a temperature of 55° F., and are allowed to remain immersed for a period of 10 minutes. Following this the hands or feet are removed from the cold water and examined for local color changes. These changes — cyanosis, pallor, redness or mottling of the skin — are carefully recorded.

VOLUMETRIC DETERMINATION

Purpose — A simple and accurate means of determining enlargement of a lower extremity as an aid in the diagnosis of thrombophlebitis, phlebothrombosis, or other vascular disease associated with enlargement of the lower extremity.

Equipment and Technic — A 20 gallon galvanized iron container (garbage can) is used. The concave floor is filled with a shallow layer of cement to produce an even, flat surface upon which the patient can rest his foot. Just above this floor an ordinary water faucet is soldered into place to permit emptying of the water into a suitable waste drain. At the top of the can an overflow pipe is soldered in place. At the inner aperture of this overflow pipe a horizontal lip is soldered so as to permit a more sharply defined cut-off of the overflowing water. Under this overflow pipe a glass container of about 7500 cc capacity, calibrated at room temperature in 50 cc gradations, is placed to catch the water displaced by the immersed limb.

At the start of the test the can is filled to overflowing. The excess water is collected from the overflow spout into any waste receptacle and then discarded. The water is used at neutral temperature, between 92° and 94° F., to minimize vasoconstrictor or vasodilator effects through contact with water either too warm or too cold. The patient to be tested stands with one foot on a wooden platform placed next to the test apparatus; the height of the platform corresponds exactly to the level of the cement floor in the can. This is done to permit equal weight distribution of the two extremities in order to avoid differences which might arise as a result of unequal muscular contraction. The extremity to be tested is then immersed in the large container and the foot placed squarely onto the center of the cement bottom. The water displaced by the immersion of the extremity is collected into the calibrated bottle, which has replaced the waste container used in setting up the apparatus. The amount of water displaced is recorded after overflow has ceased. This procedure is performed five times consecutively for one limb, following which the same procedure is repeated for the contralateral limb. The average of the five readings for each limb is recorded as the volume of the limb. As a rule the difference between the two limbs is not in excess of 2 to 3 per cent of the volume of the larger limb in a normal person.

CONCLUSION

The results of these diagnostic procedures are frequently the basis upon which the physician establishes or confirms his diagnosis; his interpretation of the data will also form the basis for the therapeutic management of the patient.

As in the performance of other types of diagnostic tests such as X-ray or the various laboratory tests, the results obtained are only as reliable as the technical skill used in their performance by the physical therapist. It is therefore essential that the therapist exercise extreme care and accuracy in his work so as to aid in the establishment of as accurate a diagnostic picture as possible. Since many patients with peripheral vascular disease are threatened by loss of limb the responsibility of the physical therapist cannot be too strongly emphasized.

SUGGESTED READING

1. Allen, E. V., Barker, N. W., and Hines, E. A., Jr.: Peripheral Vascular Diseases, 2nd Edition. Philadelphia, W. B. Saunders Co., 1955
2. Abramson, D. I.: Vascular Responses in the Extremities of Man in Health and Disease. University of Chicago Press, 1944
3. Robertson, C. W., and Smithwick, R. H.: Reflex peripheral vasoconstriction, Boston Medical Quarterly, Vol. 1, No. 4, p. 8, December 1950

Dues Notice

Annual dues were payable on May 1st. Your prompt response will be appreciated. The Bylaws require that members whose dues have not been received by August 1st shall be suspended from membership. If you did not receive a bill please do not wait to receive our follow-up notice.

May we also call to your attention that according to the Bylaws only those members not actively engaged in the practice of physical therapy are eligible for inactive membership. Such members may transfer to inactive membership by applying to the Board of Directors.

The Physical Therapy Profession and the Political Process

Barbara Oak Robinson, B.S.

Political scientists state that the professions play a significant political role. V. O. Key, Jr., asserts "The prestige enjoyed by the professions has given their associations a political role of considerable importance." It is the purpose of this paper to show how the physical therapy profession, although comparatively small and relatively new, is already playing its part in the political process.

The procedure will be: (1) to give background information about the profession and its organization, (2) to give a factual account of the political role of the profession at both the federal and state levels, and (3) to interpret certain significant findings.

The means used to obtain the material for the study were primarily: (1) a perusal of the *Physical Therapy Review*, the official publication of the American Physical Therapy Association, from May-June 1943 through November 1955; (2) correspondence with Mary E. Haskell, Associate Executive Director of the American Physical Therapy Association; and (3) a questionnaire sent to 51 state and territorial chapters of the American Physical Therapy Association.

The Physical Therapy Profession and Its Organization

Physical therapy is the treatment of disease by physical measures. Some of these measures have been used since ancient times, but the general acceptance of physical therapy in the United States has come only since World War I. The pioneering in the army at that time led to a great advance in the field. In 1925 the Council on Physical Therapy of the American Medical Association was instituted and gave further impetus to the vocation. World War II helped to establish it even more firmly.

The pioneers in physical therapy, a group of ex-army aides, organized in 1921 under the name of American Women's Physical Therapeutic Association. In 1922 the name was changed to the American Physiotherapy Association and the membership was opened to men. The present title of the organization, the American Physical Therapy Association was adopted in 1946. In keeping with the trend of the times and in an effort to distinguish the qualified members of the profession, physiotherapy was changed to physical therapy.

The American Physical Therapy Association, according to its Bylaws, has as its functions:

(a) To define functions of physical therapists and promote standards of physical therapy service.

(b) To promote physical therapy by defining and developing sound standards of physical therapy education and by cooperating in planning the development of adequate facilities of good organization, administration and curricula.

(c) To promote legislation and to speak for physical therapists in regard to legislative action concerning general health and welfare programs.

(d) To promote and protect the economic and general welfare of physical therapists.

(e) To provide consultation and other services within the purview of the American Physical Therapy Association to individuals, agencies, schools and communities.

(f) To represent physical therapists and to serve as spokesman with allied professional, governmental and international groups and with the general public in regard to matters relating to the object of the American Physical Therapy Association.

(g) To promote scientific research in physical therapy.

There are several classifications of members in the Association. For the purpose of this paper it is necessary to mention only the active members. "To be eligible for active membership a person must possess the educational qualifications and training prescribed and published by the Board of Directors." Most institutions of high professional standards will not employ a physical therapist unless his training is equivalent to the educational requirements of the Association; membership in the Association is recognized by employers as an additional professional qualification. There are at the present

Association member. This article is the result of work done by Mrs. Robinson as a postgraduate student in political science at Kansas State College.

time 35 accredited schools of physical therapy in the United States and Puerto Rico including an accredited school sponsored by the U. S. Army Medical Service. These schools are approved by the Council on Medical Education and Hospitals of the American Medical Association.

The component chapters of the American Physical Therapy Association hold charters from the Association. There are one or more chapters in every state, the most recent state chapter receiving a charter in June 1954 (Wyoming). Fifteen of the state chapters are further subdivided into districts, and there are 33 of these. There are also chapters in the District of Columbia, Hawaii, Puerto Rico, and Alaska (organized in 1955). The trends of growth of the physical therapy profession, as portrayed by an increased number of chapters and schools, are shown on the table below.

TABLE I

TRENDS OF GROWTH OF THE PHYSICAL THERAPY PROFESSION

	Year					
	1930	1935	1940	1945	1950	1955
No. of Chapters of APTA	14	18	29	35	55	58
No. of Accredited Schools			16	32	31	35

The officers of the Association are: President, Vice President, Secretary, Treasurer, and the Speaker of the House of Delegates. These officers together with four Directors constitute the Board of Directors. The House of Delegates, which consists of delegates elected by the component chapters, elects the officers for two-year terms and as vacancies occur, two directors for four-year terms.

It is evident that the officers are truly representative of the members of the Association. There is good replacement of officers but with some provision for continuity as evidenced by subsequent election to a second office.

The House of Delegates has all legislative powers and authority to determine the policies of the Association. However, an attempt is made to see that such decisions really represent the wishes of the entire membership. An editorial of the *Physical Therapy Review*, April 1951, reads:

". . . . Each [of the delegates] is instructed [by his state chapter] how to vote on certain specific issues so as to fulfill the wishes of the group and is expected to bring back an informative report dealing with the deliberations of the House of Delegates. This voting power and the dissemination of news, actions, and issues are vital parts of the basic democratic philosophy of our total organization and mirror the "control-by-membership" idea upon which the APTA is based."

The Code of Ethics of the Association is binding on its members. According to the revised (1954) Bylaws, the Chapter Executive Committee (State) or the Judicial Committee (National) may bring disciplinary action against a member for violation of the Code. This action may be censure, suspension, or expulsion. It is presumed that expulsion and possibly suspension would seriously affect a member's ability to retain or acquire a good job.

It has been said that the greatest concern to professional organizations is control of entrance to the professions. Opinions have been ventured that the AMA is guilty of trying to limit the number of physicians. Whether this is true is of no concern here. It is definitely not true of the physical therapy profession. Physical therapists are in demand. Hospitals, clinics, schools, and government agencies are expressing their needs. The reason for controlling the practice of physical therapy is to assure the patient of a competent professional worker. As Dr. Hellebrandt has said, "Admission requirements to schools of physical therapy are higher today than at any point in the brief history of American education in physical therapy, largely because of a self-imposed elevation of standards."

There is constant recruitment going on in the field since there is such a shortage of personnel and since most of the schools are not filled to capacity. The Association has spent over $2,000.00 to perfect an examination for members of physical therapy organizations affiliated with the World Confederation for Physical Therapy. This means that the ranks, so to speak, are open to foreign trained physical therapists if they are well qualified.

LEGISLATIVE ACTIVITY OF THE AMERICAN PHYSICAL THERAPY ASSOCIATION

As was stated earlier in this paper, one of the functions of the American Physical Therapy Association is to promote legislation and to speak for physical therapists in regard to legislative action concerning general health and welfare programs. Until 1955 the Association had a

public laws committee but it has been abolished because information of this type must be collected and planned by the National Office staff — no member with a full time job can devote adequate time to it.

The major legislative activities of the American Physical Therapy Association from 1946 to the present have concerned obtaining legal recognition of the physical therapy profession through the enactment of Physical Therapy Practice Acts whereby physical therapists are legally licensed or registered. The Association furnishes advice and guidance to the state chapters regarding the contents of bills (a model law has been drafted by the National Office which is available upon request), and in some cases, "we have written letters in support of state legislation to physicians and other organizations. In general, however," Mary Haskell says, "it has been found that national intervention in state legislation is not effective or welcomed."

Federal legislation

The Association is interested in the promotion of certain federal legislation as well as the state legislation mentioned above. Let us delve into these interests at the national level first and then consider them at the state level. The decision in regard to support of federal legislation by the Association is sometimes made by the Board of Directors and on other occasions (by resolution) by the House of Delegates. The Association does not employ a lobbyist but, according to Mary Haskell, "we alert our members to state our policy on such legislation by contact with their elected officials." It does this by publishing in the *Physical Therapy Review* bills to be proposed or already proposed and by urging its members to act. On several occasions, however, the Association has written letters to congressmen in support of bills of interest to the profession.

When the Committee on Public Laws was in existence it consisted of three nationally appointed members and the legislative chairman of each local chapter. The functions of the Committee, as stated in a January 1950 *Review* editorial, were to encourage interest in and provide information for the study of:

1. The Association (both local and national)
2. State legislation regulating the education and practice of physical therapists as well as all measures which are related to the maintenance of health and to the effective care of the sick
3. Federal legislation relating to public health, and
4. Parliamentary procedure according to Robert's Rules of Order.

In 1950 the Committee on Public Laws urged the support of physical therapists for Senate Bill — S 2352 and House Bills — HR 5567 and HR 5835. These bills were to increase the funds to the Crippled Children's Services of the Federal Security Agency. The *Review* said:

> "*Remember*, to obtain legislation, your congressmen and senators must know the support they have by their constituency. They can only know from your personal letters. You know the needs for physical therapy for crippled children. Help them get it by writing to your Senator and Representative."

At the same time the Committee urged action on S 522 which was to provide funds to aid in the establishment of local health units.

Physical therapists were informed in the *Review* of November 1951 that federal legislation providing financial support of medical and allied professional schools as embodied in S 337 would not be enacted that year.

The Association in 1951 promoted interest in HR 911 and S 661 to provide for commissioning male physical therapists in the army and navy by deletion of "Women" from the Women's Medical Specialist Corps. The co-sponsors of the bill were Representative Frances Bolton and Senator Irving Ives. The *Review* reported in the April 1952 issue that the Association was still in contact with these sponsors concerning the bill. It also stated that the bill had the full support of other interested groups including leaders in Physical Medicine and Rehabilitation. (The students in the Physical Therapy School of the Medical College of Virginia took up the issue and conducted a campaign to direct the attention of Congress to these bills. They invited all physical therapists [by means of a letter printed in the *Review*, May 1951] to join their efforts and offered to send all interested persons the "organized facts."

In June 1953 the *Review* announced that HR 4447 was introduced in the House of Representatives by Mrs. Frances P. Bolton. This bill was to provide for the appointment of qualified male persons as nurses, physical therapists, occupational therapists, and dietitians in the United States Army Reserve. (It seems that this was a reintroduction of HR 911 which was introduced in the preceding session.)

The Public Laws Committee in 1954 endorsed the proposal of Representative Bolton to draft a bill with the principle of equal pay for equal work regardless of the sex of the worker.

Reports of two bills before Congress which had direct bearing on physical therapy were submitted to the Association membership by the Committee of Public Laws in its annual report, 1953-1954, published in the September 1954 *Review*:

(1) The Hill-Burton Bill. In brief this bill provides financial assistance to increase diagnostic and treatment facilities in hospitals for the chronically ill. The bill has passed the House and Senate and is in conference.

(2) The O.V.R. (Office of Vocational Rehabilitation) Bill adds to grants for the education of necessary personnel to carry out rehabilitation activities. This personnel of course includes physical therapists. The bill is in Committee.

The signing into law of S 2759 by the President was announced in the October 1954 issue of the *Review*. This bill was of particular interest to physical therapists because it directly affected them by providing for expanded rehabilitation services under the direction of the Office of Vocational Rehabilitation, as well as providing for financial aid to institutions which train personnel needed in physical rehabilitation.

The October 1955 *Review* reported the passage of Public Law 294 (the "Bolton Bill" previously mentioned), which changed the name of the Women's Medical Specialist Corps to Army Medical Specialist Corps and made Reserve commissions available to men also.

State legislation

As is the case, like other professional groups, the chief political efforts of physical therapists are at the state level. Regarding state legislation, in May 1951 a *Review* editorial said:

". . . . increase of interest in the problems of legislation for physical therapy should be of serious concern to each one of us in the profession. All such legislation must, by its very nature, have a real and long reaching effect on our future status as a profession, on our financial security, and on our ability to provide what we feel is adequate patient care."

It is evident that the efforts of the national staff and of the local chapters of the Association have paid off. To date 24 states plus the territory of Hawaii have laws pertaining to the practice of physical therapy. The trend in passage of physical therapy laws is shown in table 2.

Analysis of Survey

In order to determine the extent of the Association's legislative activities at the state level,

TABLE 2

TRENDS IN ENACTMENT OF PHYSICAL THERAPY LAWS

Year	No. States Passing Physical Therapy Laws
1949	2
1950	0
1951	8
1952	2
1953	5
1954	0
1955	5

a questionnaire was sent to 48 state chapters, the District of Columbia, and the Territories of Hawaii and Puerto Rico.

Of the 51 sent out, 37 questionnaires were returned (73 per cent); 20 of the 25 states (or territories) with laws regarding the practice of physical therapy answered (80 per cent); 17 of the 24 without such legislation responded (71 per cent). The high percentage of replies seems to justify general conclusions based on the sample analyzed.

Let us consider the questions in order:

1. *Who, if anyone, initiated or is attempting to initiate legislation pertaining to the practice of physical therapy in your state?*

The answers tabulated from the states which already have physical therapy laws are:

17 state APTA
1 Board of Examiners for P.T.
2 state medical society
1 state health dept.
2 organized unqualified P.T. group
1 lawyer who was helped by a P.T.
1 state hosp. assoc.
1 Board of Health
1 State Registry for P.T.'s*

The answers for states without such laws:

5 no one
12 state APTA

In the states with legislation, only 3 of the 20 state chapters had nothing to do with the initiation of the law. In one (Hawaii) the Board of Health initiated the bill. In another an amendment to the Medical Practice Act in 1921 included the licensure and regulation of physical therapy. In the former, the state APTA chapter subsequently obtained desired changes in the law. In the latter case there was no such need, but the chapter has successfully kept bills detrimental to the interests of the profession from

* The Maryland State Registry for Physical Therapists was started several years ago in order to have a state organization for promoting legislation.

reaching the floor. In the third state, there was no indication as to who initiated the bill. However, the law was rewritten by the Board of Examiners for Physical Therapists (composed of doctors) in indirect collaboration with representatives of the state chapter of APTA.

Now turning to the states without such laws, there are five state chapters listed which have not initiated legislation. One of these is too new to consider it as yet since the problem of organization is still the major problem, but legislation is being discussed by the members nevertheless. Two states have not felt the need for legislation; however, they are both drawing up laws in preparation for any future need. A fourth chapter is too small to consider legislation.

Of the 12 state chapters in the process of initiation, one has made unsuccessful attempts while another has been able to block undesirable bills. Among the various reasons given for lack of success so far are: lack of cooperation from the State Board of Health (1), lack of cooperation from the state medical society (4), and opposition from a state hospital association and a state educational society (1).

2. *If your chapter has made such efforts, what advisors does or did it have?*

The chapters in states with legislation answered as follows:

17 lawyer	3 doctors
4 lobbyist	1 public health officials
5 state medical society	4 national APTA
1 Board of Health	1 Medical Advisory Council
1 people influential with legislators	

The chapters in states without legislation answered thus:

10 lawyer	1 director Board of Health
1 lobbyist	3 Medical Advisory Committee
1 state representative	1 public policy comm., state medical society
3 doctors	1 hospital administrator
1 state senator (Pres. pro tem)	

3. *How was your project of legislative activity financed?*

Chapters in states with legislation answered in the following way:

16 state APTA funds	1 state medical society
1 State Registry for P.T.'s	3 local assessment
	1 doctor's clinic

State chapters without legislation answered as such:

6 no funds used	1 assessment
5 state APTA	

Not all of the states reported the sum of money used. Of the states which named the amount, $50.00 was the largest and $9.28 was the smallest. In some other state chapters the members paid for their own phone calls and telegrams; in one, the lawyer's fees were donated. Three replies indicated that the expenditures were very small. The state chapters which obviously spent larger amounts of money will be discussed later.

4. *What means were used to inform APTA members of legislative progress?*

The answers of chapters in states with legislation:

13 regular meetings	9 bulletins
11 special meetings	5 letters
2 personal contact	2 telephone committee
1 telegrams	1 special legislative committee

The answer of chapters in states without legislation:

11 regular meetings	5 bulletins
3 special meetings	2 letters

The Tennessee chapter used an interesting means of informing its members about the problems of legislation. A panel discussion on various aspects of state legislation to register physical therapists was held. Included on the panel were: a physical therapist, the State Commissioner of Public Health, a physiatrist, a voter, and an attorney.

5. *What actions were APTA members urged to take, if any?*

The chapters in states already having physical therapy laws answered thus:

15 write to legislators	3 contact politically important people
10 "talk it up"	4 personally contact legislators
2 attend hearings	2 wire legislators
1 testify at hearings	1 contact doctors
1 frame legal requisites	1 contact hospital employees
1 contact patients	

The answers of chapters in states without legislation:

7 write to legislators	1 contact county medical society
9 "talk it up"	1 contact ex-patients
1 contact doctors	1 speak to supporting groups
1 encourage good public relations with doctors, patients, legislators, and educators	2 check with other states having such legislation; draw up laws to introduce at next session

6. *What individuals or groups opposed APTA's proposed bills?*

The answers of chapters in states with legislation were:

- 3 none
- 1 foreign trained P.T.
- 2 unqualified P.T.'s
- 3 legislators
- 1 YMCA health educator
- 8 chiropractors
- 9 naturopaths
- 1 beauticians
- 1 representative of unrecognized school
- 1 YMCA director
- 1 herb dealer
- 1 reflexologist
- 1 osteopaths
- 6 physical therapy association (unrecognized group)
- 3 massage group

The answers of chapters in states without legislation were:

- 3 none
- 1 unqualified P.T.'s
- 1 APTA members
- 1 educational society
- 1 state medical society
- 1 state hospital association
- 1 chiropractors

One chapter which had cooperation instead of opposition from both the chiropractors and osteopaths commented that this was because the APTA did not present any competition to these groups when APTA members are licensed. The reason given for the opposition from APTA members in another state was the nonreciprocity between states (reciprocity will be discussed later in this paper). The opposition encountered from the state medical society in still another state was because the bill did not include a section forbidding private offices. The public policy committee of the state medical society in that state, however, had recommended approval of the bill.

7. *What groups cooperated with your state's legislative efforts?*

The chapters in states with legislation had the following cooperation:

- 4 occupational therapists
- 17 state medical society
- 3 osteopaths
- 4 state graduate nurses assn.
- 1 allied medical groups
- 1 doctors
- 1 state health dept.
- 2 prominent people
- 2 interested citizens
- 1 representatives of state universities and other universities in state
- 1 State Licensing Board for Healing Arts
- 1 hospitals
- 1 Elks
- 1 State Registry for Physical Therapy
- 1 National Foundation for Infantile Paralysis—local group
- 2 State Society for Crippled Children
- 1 Business and Professional Women
- 1 Cerebral Palsy Association

The states without legislation have the following cooperation:

- 2 none
- 4 state medical society
- 1 prof. nursing assoc.
- 1 public policy comm. of state medical society
- 1 individuals in allied medical professions
- 1 National Foundation for Infantile Paralysis—local group
- 1 state health dept.
- 1 medical auxiliary

Attached to each questionnaire was a blank sheet and respondents were invited to record any additional comments. Some of the most pertinent are worth mentioning. Two state chapters added that a few of their members registered as lobbyists. An opinion is ventured that this may have been the case in other chapters also but since the question was not asked on the questionnaire there is no way of knowing how many. Several states commented that it was helpful to have legislators predisposed in their favor. The lawyers of two chapters were legislators who sponsored its bill. In another state a senator was the father of a handicapped child. Four state chapters remarked that the bills which they introduced were initiated in "self-defense." Four chapters mentioned that the bills which passed included clauses which they did not like but which were attached by other groups that would be affected by the legislation.

Problems encountered

Three state chapters stand out from the others in the problems they face with legislation. Each of these is viewed in turn.

California, it seems, has a particularly difficult time politically. There are in that state great numbers of chiropractors and naturopaths as well as other physical therapy groups—all of whom opposed the APTA when it first introduced legislation in 1943. The original bill proposed by the APTA was a purely defensive one to legally define the profession and keep its members from being included in massage bills and the like.

At that time, the California Medical Association voted that it would take no formal action either to help or hinder the Association. Without the state medical society's formal backing and powerful lobby, the legislative efforts of the APTA were unsuccessful. After this failure in Sacramento, the APTA finally managed to retain officially the California Medical Association's lawyers and lobbyists. It was this open assistance which helped the Association (since some informal help on the first attempt had proved insufficient).

The California APTA pays a fee for the serv-

ices it receives but probably could not get men of such high caliber for the fee paid if it were not for the CMA.

A correspondent from the California chapter says that it has accomplished legislation but the result is still chaos and misunderstanding. The California legislature enacted two physical therapy laws in 1953. One is a registration act under the State Board of Medical Examiners; the other is a licensing act for physical therapists not qualified for registration.

In the 1955 California legislature, there were introduced numerous bills which concerned the physical therapists of that state. One senate bill sought to make the term "registered physical therapist" illegal and to group together all physical therapists regardless of training.

The Washington state chapter has also found it advisable to be alert politically. Mrs. Miriam K. Carlsen, chairman of the Public Laws Committee of the Washington State Chapter writes:

> "The need for licensure for professional physical therapists in Washington became apparent in 1948 following two sessions of the legislature at which delegates from the Chapter opposed bills presented by the masseurs and masseuses—bills which if passed would have included us.
>
> "In 1949 we took the offensive and had our own bill presented, but had to propose the bill as permissive rather than mandatory since according to our legal advice, contacts, and questions from legislators it was evident that the bill would have no chance of passing if mandatory. Questions posed by legislators who were contacted regarding support of the bill included such as—did our bill interfere with the unqualified physical therapists who were already practicing?
>
> "The bill passed the House with six dissenting votes and one amendment imposed under the penalty section, which section provides in substance that—one who is not licensed may not represent himself to be a "Registered Physical Therapist," or use the letters "R.P.T." or imply that he is such, and making violation a gross misdemeanor. The amendment which was attached to the bill in the House to satisfy the opposition added to the section the words "*Provided*, that nothing in this act shall prohibit any person who does not in any way assume or represent himself or herself to be a 'Registered Physical Therapist,' abbreviated R.P.T., from doing other types of therapy." No further amendments were made and the bill passed the Senate with no dissenting votes.
>
> "We were advised at the time of writing the bill to incorporate to protect our name which we did. The chapter paid $150 for incorporation ($100 less than the usual fee due to the fact that we were a nonprofit organization and less work was entailed), $200 for the attorney's services in connection with the bill, $77 for a legal brief of the bill for the governor, $50 to a lobbyist (not to include actual lobbying) from the State Nurses Association for keeping us informed of progress and to notify us of the proper time for chapter members to go to Olympia and lobby; an assessment to members of $5 augmented our funds sufficiently to pay for expenses incurred."

Another state chapter which is having special problems is New York. Here, a major problem concerns the discrepancy in the small number of schools registered by the State Education Department, less than half of the 35 physical therapy programs approved by the Council on Medical Education and Hospitals of the American Medical Association. The New York law which is mandatory stipulates that physical therapists may be licensed only on examination and that to be admitted to the examination the applicant must either (a) produce evidence of graduation from a department-approved physiotherapy course of at least four academic years in a college or university or (b) satisfy the regents (of the University of the State of New York) that he has satisfactory equivalent training.

Members of the American Physical Therapy Association in New York have also recently been concerned with indications that a number of licensed physiotherapists are interested in amending the law to make it possible to practice physical therapy independent of medical supervision.

The New York chapter of the American Physical Therapy Association employs a legal counsel and representative who resides and practices in Albany, New York. He serves as the chapter's "watch-dog" in the legislature and guides the moves.

Laws Pertaining to the Practice of Physical Therapy

The discussion of state laws relating to the practice of physical therapy will include the 24 states and the territory of Hawaii which had laws as of August 1955.

Most of the recently enacted laws pertaining to the practice of physical therapy are based on the model law which was referred to earlier in this paper. The title suggested by the model law is "Physical Therapists Practice Act." Eleven state laws have this title. The model law includes the following subjects: 1. Definitions, 2. Conditions of Registration, 3. Application for Registration, 4. Reciprocity, 5. Examination, 6. Refusal, Revocation and Suspension of Registration, 7. Conditions of Practice of Registered Physical Therapists, 8. Powers and Duties of Examining Board and 9. Constitutionality.

In 10 of the states, there are "mandatory" laws which prohibit the practice of physical therapy without registration. In the rest of the 24 states, the laws are "permissive" allowing the

use of the title Registered Physical Therapist (or similar designation) by qualified persons and prohibiting use of such titles by others.

Reciprocity is provided for in 19 states. Also, all the state laws include a section stating that a registered physical therapist must not practice independent of the prescription, direction or supervision of a licensed physician or surgeon. In addition, 21 of the state laws provide for two or three physical therapists to be on the physical therapy examining board.

Seven states have used the objective licensing examination which was constructed by the Professional Examination Service of the American Public Health Association in consultation with an advisory committee of the American Physical Therapy Association.

CONCLUSIONS

The profession of physical therapy has grown in stature and enhanced its prestige in the past ten years or so. It is evident also that this profession, primarily at the state level, is playing a significant part in the political process.

The approach used by the majority of the state chapters of the American Physical Therapy Association in attempting legislation show that the profession is still young and has much to learn about politics. Many state chapters seem to depend on aid from individuals; mature professional groups ally themselves with other organizations. The physical therapist's methods of exerting political pressure are not as well developed as those of the old established groups who have perfected their technics. The small amount of money expended by the majority of state chapters substantiates the fact that the group is new to politics.

It would appear that inertia and ignorance deter success more than opposing pressure groups do. Of course, there are exceptions as indicated by the situations in California, New York, and Washington. In these states the situations are more typical of the lobby struggle than in any of the other states. The internal struggle of "recognized" versus "nonrecognized" physical therapists is the prevalent strife.

It is particularly evident that organized medicine can do much harm or great good to the profession of physical therapy. The profession is still young and weak enough to need a great deal of active assistance from the medical group. Several of the state chapters of the American Physical Therapy Association indicated that they needed the active support of the state medical society to be successful in obtaining legislation. All of the states which are anticipating success in the near future in legislation have the active support of the state medical society.

Since such a large number of the state laws pertaining to the practice of physical therapy provide for physical therapists on the examining board, there seems to be a tendency toward the establishment of the guild system—that is, control over entrance to the profession by the profession itself. This tendency, according to V. O. Key, Jr., is a "characteristic of the politics of the professional associations," but any absolute guild system may or may not be wise. Because there are also members of the medical professions on the examining board, the "guild system" is not yet established.

The profession of physical therapy is learning fast by its experiences. One indication of this is an ever increasing awareness among the state chapters of the need to be politically alert. Forty-four chapters in 1954-1955 recognized the existence of current legislative problems in their respective states. Chapters are being urged to recognize the fact that legislative success does not mean their task is over. Furthermore, students of physical therapy are showing an interest in the legislative arena. Future actions in the political field will be guided by these experiences and probably a more powerful participant in the political field will emerge.

Acknowledgement is made to Dr. Louis H. Douglas, Professor of Government, Kansas State College, for his guidance and encouragement.

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Suggestions from the Field

Underwater Support for Leg Whirlpool

Betty M. Byrd, B.S., and E. Sue Flowers, B.S.

A support which may be used with a leg whirlpool has been designed by the staff of the Department of Physical Therapy at the North Carolina Memorial Hospital. This was done in order to accommodate an increased number of patients requiring hydrotherapy and permitted use of the leg whirlpool for small children. While it may be contraindicated for certain children to sit or stand in a whirlpool, this support enables a child to lie in a safe position (see Fig. 1). At the same time, use of the whirlpool frees the Hubbard Tank for use by larger children and adult patients.

The device is lightweight and can easily be attached to or removed from the whirlpool and is collapsible for storage purposes. Copper pipe was selected as desirable material because of its resistance to corrosion. The device was constructed in the engineering shop of the hospital at nominal cost.

The support has seven parts. They are:

1. A rectangular frame 33 inches long and 12½ inches wide. This was made of ¾ inch copper tubing with 4 copper elbow fittings (see Fig. 2).
2. Two sets of detachable uprights which are adjustable for depth in the water (see Fig. 2). Each upright has a curved or hammered lip 1 inch wide and ¾ inch deep in which the frame rests.

The uprights have series of holes to accept "s" shaped hooks for elevation of the device in the water. The hooks attach to the ends of the whirlpool. (See figure 2 for separate parts, figure 3 for the parts in place, and figure 4 for the support placed in the whirlpool.)

a. Shorter uprights are 9½ inches long with cross bar supports 12½ inches wide. This unit supports the head section of the frame.

b. Longer uprights are 23¾ inches long with cross bar supports 12½ inches wide. This unit is the foot section and can be adjusted to vary the depth of the frame on the water.

The uprights were made of ½ inch copper tubing and the cross bar supports were made of ¼ inch solid brass tubing since copper tubing in this size was not available. Exposed tips on the uprights were capped with rubber crutch tips for safety.

3. Four "s" shaped hooks for attaching the uprights to the ends of the whirlpool (Fig. 2). These were made of ¼ inch solid brass tubing and are 3½ inches long. One curve of the "s" hooks over the rim of the whirlpool and the other inserts into the desired hole in the upright and thereby supports the frame at the desired level. Laced canvas can be used to cover the copper frame, or bath towels can be pinned over the frame. The use of towels allows more frequent changing of the cover, but the canvas provides a more rigid support.

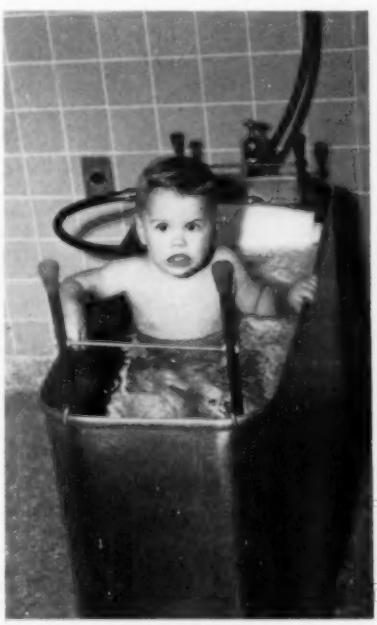

Figure 1.

From the Department of Physical Therapy, North Carolina Memorial Hospital, University of North Carolina, Chapel Hill. Mrs. Byrd is a staff physical therapist and Miss Flowers is assistant chief of the Department of Physical Therapy.

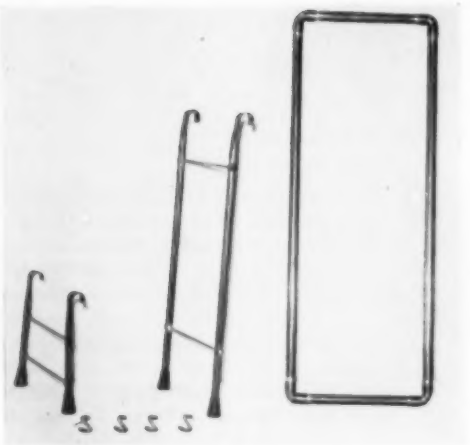

Figure 2.

Use of the leg whirlpool device presents several advantages.

1. It frees the Hubbard Tank for use by larger patients.
2. Small children may be easily and safely treated.
3. Some children are less fearful of small quantities of water.
4. It is economical because smaller quantities of water are used.
5. More patients can be treated because the whirlpool can be filled, drained, and cleaned in less time than is required if the Hubbard Tank is used.

A disadvantage is that abduction of the hip and shoulder joints is limited because of the narrowness of the whirlpool. When equipment is in great demand and time is at a premium, use of the support provides most of the advantages of underwater treatment for small children.

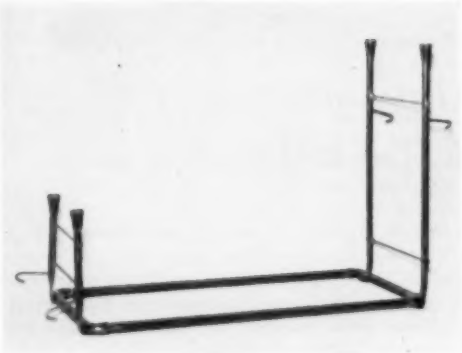

Figure 3.

Figure 4.

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Editorial

A Few Remarks on Physical Therapy by an Orthopaedist

It has been said that there are three types of persons: 1) those who have things happen to them, 2) those who make things happen, and 3) those who do not know what has happened. I can assure you that your leaders in physical therapy have belonged to the second group. In the last three decades, your field of medicine has steadily grown in importance and has gone forward with particularly rapid progress in the last decade and a half, thanks to the planning of your leaders who have made things happen.

First, I should like to discuss a few matters concerning physical therapy on the national, state, and local levels. On the national level, which involves principally the activities of the American Physical Therapy Association (APTA), policies are determined, basic standards of good practice are set, new schools established, old schools kept up to date, campaigns started for the recruitment of personnel, and well planned programs of public education carried on. Unfortunately, too many of the public still cannot separate good physical therapy as practiced by the trained physical therapists of today from the work of the old practitioners of massage. The public, without which your work would not live, must be informed constantly concerning what physical therapy is, what its values to medicine are and what can be expected in the care of the individual patient. In many states, as you may know, there have been difficulties in effecting adequate physical therapy laws. Good legislation for physical therapy is one of the most pressing and important problems you have to face today. The APTA must be the leader in this activity; it must give advice, and should at all times have representatives in the states for this purpose when legislative bodies are in session and considering legislation affecting physical therapy. Progress has been made in many states in the establishment of adequate laws. These laws have been the means for the upholding of standards of education and training and preventing the unqualified and, often times, not too ethical practitioner from inflicting on the public what he has to offer, too often misnamed physical therapy.

Editorial

When there are laws, one of the responsibilities of APTA and its state chapters is to see that these laws are enforced. In many states there are no laws and in some the laws are weak and almost meaningless. In these states there is much work to be done. The APTA needs at all times to be strongly organized for the promotion of good state legislation. It would be well to consider having a national APTA fund established to finance this special activity with a definite assessment of each APTA member. State chapters, as a whole, particularly in the South, need good advice, a little money and help from your national organization. Each state activity is a part of the whole and if one state is weak, great harm can result to all of physical therapy. Your organization is large and strong enough, and has been so for many years, to really fight for what is right whenever such a fight is called for.

On the state level, there must be a never ending attempt to maintain standards of practice for all physical therapists. A program of constant and continuing postgraduate education with lectures, clinics and scientific meetings for all physical therapists, APTA members and nonmembers alike, should be carried on by the state chapter. It would be well for the APTA to consider having criteria for membership, such as the Academy of General Practice has; namely, in order to maintain membership, a certain number of hours must be spent annually by each member in postgraduate education. On the state level, your society recruitment committees should be active and always on the lookout for new students. They should plan a program each year to actively interest the young high school graduate in a career of physical therapy.

One of the most important things on the local level is good public relations. This is best done by the creation and maintenance of a good patient-therapist relationship. There is no better way of creating goodwill on the part of the public than in the development of confidence, trust, and friendship between the therapist and the patient. This is far more effective than the publicity of press, radio and television. We have found in our community that one of the greatest forces for good public relations is our ten-year old Delaware Curative Workshop. This institution has been a joint occupational therapy-physical therapy activity and has the support, and I would say this is whole hearted, of the whole community. There must be good relationships with the local medical profession; it should be informed concerning what you are doing. Physicians in different fields of medicine should be asked to talk at your scientific meetings. The availability of positions for physical therapists should be made known by the local society. In some communities, city or county physical therapy groups may be very effective in giving information on jobs to the right sources.

All I have mentioned on the national, state, and local levels are subjects which should be constantly thought about, discussed at meetings, and from time to time, an analysis made of how effective a job is being done. It should never be said of physical therapy, as one radio commentator recently stated, "The trouble with the world today is that there is

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a *paralysis of the analysis.*" You must frequently look into and reflect on what you are doing, and when indicated, change to meet the changing conditions.

It is needless for me to say anything about rehabilitation to physical therapists. I am sure you know the important place physical therapy plays in this field of medicine. Rehabilitation has been fathered, mothered, and nursed by physical therapy for years; in fact, it can be rightfully said that physical therapy, with the help of a few orthopaedists and other physicians interested primarily in physical medicine, "borned" rehabilitation. Unfortunately the number of orthopaedists really active in rehabilitation programs today can still be called "few" and the leadership has been taken over by the physical medicine specialty. In the community, physical therapists should be active in total rehabilitation programs in corralling resources, in encouraging the team approach for all the active participants and in working with the medical profession in setting up rehabilitation centers.

There has been a great deal said in the past and much more is being said in the present about the psychological aspects of medical treatment, particularly relating to those patients requiring long term care and rehabilitation. The statement has been made that 65 per cent of all patients in doctors' offices have psychosomatic disorders. Dr. Howard A. Rusk stated recently that 55 per cent of the patients in the Institute of Physical Medicine and Rehabilitation have emotional problems. In our Alfred I. duPont Institute we have repeatedly analyzed the psychological states of the crippled children and have never found less than 10 per cent of these children with definite psychological abnormalities and sometimes the percentage has been as high as 25 per cent. To me this strongly indicates that the physical therapist, in order to do the most effective work, must have a good knowledge of psychology and psychosomatic disorders and know a few basic facts about pyschiatry. You can do a great deal in helping the patient in ways other than the application of the modalities of your profession. Helping the patient to help himself, showing and teaching him the activities of daily living, are things you should be constantly thinking about and doing. You must have both originality and ingenuity in your approach to the patient. You must think of things to do which may increase morale and give to the patient a greater will to do. Every patient is psychologically different and if you understand your patient and act accordingly, you can be of immeasureable help to the physician and to the patient himself in his recovery.

Recently the term *paramedical* has been applied to the therapist, particularly to the physical therapist. This is a misnomer. You are *truly* medical, *purely* medical, and *straight* medical, and are not "para," which means "nearby" or "besides." You are not workers in an allied field or ancillary specialty of medicine. You are special medical practitioners, always doing your part as it is said "to make sick people well." It has been stated that you should be called co-professional personnel. Perhaps this is a good term to use. You are a part of the practice of medicine and should never forget that this part

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carries with it to each one of you a great responsibility to do your best at all times.

One of the responsibilities you have to your community is to see that there are adequate physical therapy facilities in the hospitals and clinics. You should have committees to explore the possibilities for the further use of physical therapy in medical practice in the community. Perhaps it should be said that this is not the time to be doing such because of the shortage of personnel, but eventually the personnel shortage will catch up with the needs and then you will be wanting to broaden horizons. I think great emphasis today in your planning should be placed upon looking toward future expansion of services.

In conclusion, I would like in a small way to answer the question, "What is a good physical therapist?" I am sure that there are many of you who, with a little thought, could give a better answer but the following is my answer:

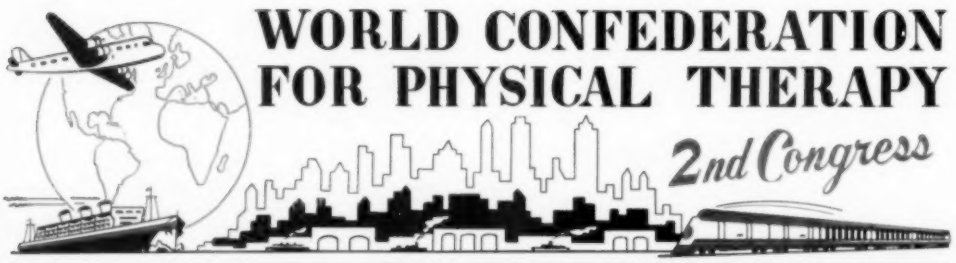
A good physical therapist is one who is —

1. thoroughly grounded in the fundamentals of medical care,
2. thoroughly trained to apply these fundamentals in practices of physical therapy,
3. fully cognizant of the great value these practices may be to the patient if properly applied,
4. able to recognize the extent and scope of these practices in medical care and is well aware of his or her limitations,
5. able to gain and maintain a patient's confidence,
6. always optimistic but, at the same time, realistic with the individual patient,
7. familiar with what is meant by patient morale and how a physical therapist can help to improve this morale,
8. able to understand the importance of the psychological aspects of disability and attitudes of patients and to recognize significant mental abnormalities, and
9. full of imagination, common sense and dedicated to the work.

We are all in the practice of medicine together. Each one of us has his or her own niche to fill. I have mine, you have yours, but most important of all to remember is that the best possible medical care with the quickest recovery and return to normal living of the patient is obtained only when everyone is working together to accomplish this result. Perhaps some of us may be considered as "prima donnas" in what we are doing, but remember that the "prima donnas," with all other medical personnel, form the team which must act together to give to the public the best possible performance in the practices of medical care, which this public so rightfully deserves.

A. R. SHANDS, JR., M.D., *Medical Director*
Alfred I. duPont Institute,
Wilmington, Delaware

Given as a Luncheon Address at
The Physical Therapy Institute of the
American Hospital Association
Philadelphia, Pennsylvania
November 11, 1955



JUNE 17—23, 1956 · HOTEL STATLER · NEW YORK, N.Y.

There's Still Time

As of May 1 advance enrollments for the Second Congress were 1,416. This means that more members of the Association will be assembled than ever before. Enrollment will remain open during the week of the Congress so that those who find they can come "after all" can be assured that they will be most welcome. Those who have attended previous conferences know that for physical therapists they are a stimulating experience and this particular meeting is bound to be the most impressive one ever. There will be a Housing Bureau at the Statler to help with accommodations. The chapters and members have made a real financial contribution to help make the Congress a success. It would be wonderful if there could be as many members present as there have been dollars given! Come and renew your old friendships and meet your new friends from this and the Eastern hemisphere.

Boat Trip

On Monday, June 18, from six to nine in the evening, the New York Chapter will be host to the members of the Congress and their guests on a three-hour boat trip around Manhattan Island. During the first part of the trip we will see some of the city by day, and later in the evening there will be the famous view of New York with its myriads of lights.

As we begin the 38 mile trip down the Hudson the piers at which the world's greatest liners dock will be on our left. Perhaps we will see one of the "Queens" or our own "United States" berthed there or making out to sea again. Proceeding down river the distinctive skyline of lower Manhattan surrounding the Wall Street district comes into view. Do you remember when the Woolworth Building was the world's tallest? You will realize that the newer "scrapers" have stolen the Woolworth's claim to fame.

On the right, with Staten Island to provide a backdrop, stands the Statue of Liberty. While searchlights play on her in the late evening, her own torch lights the way for those seeking entrance to New York harbor. Rounding the tip of Manhattan, the Battery, our boat plies its way up East River which divides Manhattan from that great borough, Brooklyn. Unfortunately, Ebbets Field, home of the Dodgers, can't be seen but we hope you won't cancel your reservations because of this. The Yankees and Giants fans will fare better on this trip since we will pass the bailiwicks of these great teams.

Northward on East River we will be impressed by one of New York's newest and most famous landmarks, the United Nations Headquarters. You will want to see more of this group of buildings than the view from the river affords and while some things are more enchanting when viewed from afar, you will find that the United Nations is awe-inspiring in all ways.

The Borough of Queens and Welfare Island with its many City institutions are along the way as we approach the Harlem River which separates Manhattan from the Bronx. High on University Heights is the Hall of Fame at New York University.

By way of the Harlem River we round the top of Manhattan and swing back into the Hudson passing the Cloisters, a museum famous for its medieval art; it is above us on the left, viewing the Palisades of the Hudson forming the New Jersey shore across the way. Ahead is the George Washington bridge, one of the six which connect Manhattan with three other boroughs and New Jersey.

These and many other sights will be pointed out by the guide on the boat. A box lunch will be served and beverages will be available on board. You will want to bring a sweater or light wrap and be sure to bring your camera! You won't want to miss this exciting Congress affair so make your reservations now!

1956 House of Delegates

This is a reminder that the 1956 House of Delegates meeting will be held on Saturday, June 16. All members are urged to attend and to participate in the discussions. Delegates must register on Friday evening, June 15, from 7:30 to 10:30 and on Saturday morning from 8:00 to 9:00. It is requested that delegates make every effort to register on Friday evening. Election of National officers will be at noon on Saturday, June 16.

Congress Registration

The registration desk located on the mezzanine in the Hotel Statler will be open on Saturday, June 16th from 2 P.M. to 8 P.M. and on Sunday, June 17th from 9 A.M. to 5 P.M. You are urged to pick up your badge and program on these days if at all possible so that late comers may be served more quickly on the following days. No one will be admitted to Congress functions who is not registered and wearing a badge.

Students Registered for Second Congress

On May 1 a total of 53 physical therapy students had enrolled as members of the Second Congress of the World Confederation for Physical Therapy. The student group represents ten schools in the United States plus schools in Canada and France. It is hoped that it will be possible for many more students from these and other schools to attend the Congress. They will be especially welcome.

In view from the National Office

Latest addition to the Manhattan skyline is the $35,000,000 New York Coliseum. Built as a showcase for expositions, trade gatherings, and sales fairs, the Coliseum rises above Columbus Circle at the entrance to Central Park. Visitors to the National Office of the American Physical Therapy Association will see, across the "Circle," one of the world's most striking examples of conservative-modern architecture.

School Section Meeting

The annual meeting of the School Section will be held in the Georgian Room of the Hotel Statler on June 23 from 9:00 A.M. to 1:00 P.M. Breakfast will be served at 9:00 A.M. at a cost of approximately $2.75. The guest speaker will be Aura E. Severinghaus, Ph.D., Associate Dean, College of Physicians and Surgeons, Columbia University.

All members of member organizations of the World Confederation for Physical Therapy who are interested in education will be welcome to attend the breakfast.

This will be followed by a business meeting at 10:30 A.M. when changes in the Rules of Government will be discussed and officers will be elected.

Speakers at Second Congress

ESTER IBSEN BAK is a member of the physical therapy staff of the Municipal Hospital and the Health Insurance Clinic for Physical Medicine and Rehabilitation, Copenhagen, Denmark. Miss Bak received her physical therapy education in Denmark and is also a qualified social worker. Miss Bak will present "Poor Posture in School Children—Report of Treatment Results" during the symposium "Body Alignment as Related to Activity."

LUCY BLAIR, Consultant, Department of Professional Services, American Physical Therapy Association, received her physical therapy education at Harvard Medical School, Courses for Graduates; and the Master of Arts degree from Columbia University. Her previous physical therapy experience includes positions with the Visiting Nurses Association of Boston, Massachusetts, and Milwaukee, Wisconsin; Consultant, Wisconsin State Service for Crippled Children. In her present position Miss Blair was responsible for the organization, orientation of physical therapists, and supervision of the Muscle Testing phase of the Gamma Globulin and Poliomyelitis Vaccine Field Trial studies. Miss Blair will participate in the panel discusson: "The Role of the Physical Therapist in the Evaluation Studies of the Poliomyelitis Vaccine Field Trials."

HENRY F. GARDNER, Orthopedic Technologist, Testing and Development Laboratory, Veterans Administration, New York, is a graduate of U. S. Army Academy of Marine Engineers, St. Petersburg, Florida, and is a certified Prosthetist and Suction Socket Limbfitter. He has served as a consultant to the Kessler Institute, and as an advisor to various clinics throughout the New York Metropolitan area. Mr. Gardner has collaborated in the formulation of the current curriculum on prosthetics being used at New York University and has served as instructor there. He has been instructor in many short term schools conducted by the Veterans Administration and the artificial limb industry. Mr. Gardner will be a member of the Symposium: "Prosthetics—Research, Developmental Aspects and Training."

MARY MCMILLAN is the Founding President of the American Physical Therapy Association. Miss McMillan received her physical therapy training in England and practiced physical therapy in Liverpool at the Greenbank Home for Crippled Children just prior to returning to the United States. Her first physical therapy position in this country was with Children's Hospital, Portland, Maine. She next served at Walter Reed Army Hospital and in the Office of the Surgeon General, Washington, D. C.

After the outbreak of World War I she was director of training for physical therapists (reconstruction aides) at Reed College, Portland, Oregon. Miss McMillan became Director of Physical Therapy Postgraduate Courses at Harvard Medical School and later pioneered as chief physical therapist at Peiping Union Medical College in China. Miss McMillan is an Honorary member of the American Physical Therapy Association and the Business and Professional Women's Club.

BASIL O'CONNOR (Harvard Law School, 1915) is President of the National Foundation for Infantile Paralysis, a position which he has held since the inception of the Foundation in 1938. Mr. O'Connor is also President of the Georgia Warm Springs Foundation and the International Poliomyelitis Congress. From July, 1944, to October, 1949, he was Chairman and President of the American National Red Cross and also was Chairman of the Board of Governors of the League of Red Cross Societies. Mr. O'Connor has been the recipient of numerous honorary degrees and awards. Among the latter are Honorary Member of the American Physical Therapy Association; Key of Honor of the Congress of Physical Medicine and Rehabilitation; Honorary Member of the American Hospital Association; and Honorary Fellow of the American College of Hospital Administration. Mr. O'Connor will discuss "Progress Through Lay and Professional Cooperation."

JONAS E. SALK, M.D., (New York University, 1939) is Research Professor in Bacteriology and Director, Virus Research Laboratory, University of Pittsburgh School of Medicine. Dr. Salk was formerly Assistant Professor of Epidemiology, University of Michigan School of Public Health, when he worked with Dr. Thomas Francis, Jr. in research on influenza and a vaccine against this disease. He also became familiar with the work being done in research on polio there. In 1947 Dr. Salk went to the University of Pittsburgh where he conducted polio research under a grant from the National Foundation for Infantile Paralysis. The success of the vaccine developed by Dr. Salk is now medical history. He has published more than 50 scientific papers on clinical, immunological, and epidemiological subjects since 1937. Dr. Salk will be the discussant following the panel discussion: "The Role of the Physical Therapist in the Evaluation Studies of the Poliomyelitis Vaccine Field Trials."

RINA SHARETT is Instructor of Expectant Parents, Maternity Center Association, New York City. Mrs. Sharett received a diploma from the Physical Education Institute, Tel Aviv, Israel, in 1952 and has been in her position at the Maternity Center since September 1955. She will present a demonstration following Eileen Montgomery's presentation "The Physical Therapist on the Obstetrical Team."

CATHERINE A. WORTHINGHAM, Ph.D. (Stanford University, 1950) is Director of Professional Education, National Foundation for Infantile Paralysis. Dr. Worthingham was formerly Assistant Professor and Director of Physical Therapy, Stanford University. She is a member of the Subcommittee on Paramedical Personnel in Rehabilitation and Care of the Chronically Ill, Health Resources Advisory Committee, Office of Defense Mobilization; and the Advisory Committee on Training, Office of Vocational Rehabilitation, Department of Health, Education and Welfare. Dr. Worthingham has served with the National Rehabilitation Advisory Council, Federal Security Agency; and as National Consultant in Physical Therapy to the Veterans Administration. Dr. Worthingham is co-author of "Muscle Testing—Technics of Manual Examination" and has contributed to professional journals in the fields of physical education, physical therapy, and education. Dr. Worthingham's subject will be "The Physical Therapy Student—His Selection and Education."

HARRY D. BOUMAN, M.D., is Professor of Physical Medicine, University of Wisconsin Medical School, and Editor-in-Chief of the *American Journal of Physical Medicine*. Formerly, Dr. Bouman was Assistant Professor of Physical Medicine at Northwestern University Medical School. Dr. Bouman has held a Rockefeller Foundation Fellowship at University College, London, and a Stokvis Foundation Fellowship at the Sorbonne, Paris. He has been a fellow in physiology at Washington University, St. Louis, and a fellow in physiology and orthopedics at the University of Rochester. Dr. Bouman is a member of the American Physiological Society and a fellow of the American Psychological Association and the American Academy for the Advancement of Science. He has done both basic and clinical research in physiology of muscle, nerve and the sense organs, and in biophysics. Dr. Bouman will present "Physiological Basis of Electrical Stimulation of Human Muscle and Its Clinical Application."

SIGNE BRUNNSTROM is a graduate of the Royal Gymnastic Central Institute, Stockholm, Sweden, and received the Master of Arts Degree from New York University. Her present positions include Consultant in Amputee Training, Institute of Physical Medicine and Rehabilitaton, New York University—Bellevue Medical Center; and Instructor, Courses in Physical Therapy and Occupational Therapy, Columbia University.

Miss Brunnstrom was formerly Educational Director and Chief Physical Therapist, Kessler Institute for Rehabilitation; Research Associate, Prosthetic Testing and Development Laboratory, Veterans Administration and College of Engineering, New York University; and Research Assistant, Prosthetic Devices Research Study, College of Engineering, University of California at Berkeley.

Miss Brunnstrom will present "The Use of Association Reaction Patterns in the Training of Adult Patients with Hemiplegia."

KATHRYN J. SHAFFER is Assistant Professor, Department of Physical Medicine, and Instructor, Course in Physical Therapy, University of Wisconsin. Miss Shaffer, a graduate of Skidmore College, received her physical therapy training at O'Reilly General Hospital and later earned the Master of Science Degree at the University of Wisconsin. Miss Shaffer has contributed to research on the quantitative measurement of muscle excitation in man. She will be co-participant with Harry D. Bouman, M.D., during the session on "Physiological Basis of Electrical Stimulation of Human Muscle and Its Clinical Application."

EUGENE E. RECORD, M.D., (McGill Medical School, 1937) is Chief of Amputation Clinic, Veterans Administration, Boston Regional Office. Dr. Record is a member of the Orthopedic Staff of the Massachusetts General Hospital, New England Deaconess Hospital, and New England Peabody Home for Crippled Children. He is a diplomate of the American Board of Orthopedic Surgery, a member of the American Academy of Orthopedic Surgery, and the Boston Orthopedic Club. Dr. Record will be a member of the panel on "Prosthetics."

N. Y. U. Physical Therapy Graduates *Reunion!*

Thursday, June 21, 7:00-9:00 P.M.

Institute of Physical Medicine & Rehabilitation
(34th St. Crosstown Bus to 1st Avenue)

Friends, fun and food; but dessert only, so have your dinner early.

"Sign up" on *Congress* bulletin board, Hotel Statler, before Tuesday noon.

Correction

An entry in "Percentages of Chapter Contributions to March 1," which appeared in the April issue of the *Physical Therapy Review* was incorrectly listed. Credit should have been given to the Kansas Chapter for 64 per cent in contributions to the Second World Congress fund.

International Meeting in Paris

The 8th International Congress of Kinesitherapy and Functional Rehabilitation will be held in Paris, September 25-30, 1956. Members of the American Physical Therapy Association are invited to attend. All presentations at the Congress will be translated simultaneously into German, English and French. The themes of the Congress will be "New Acquisitions in Kinesitherapy" and "Importance and Evolution of Massotherapy." The social program includes an evening of ballets at the opera, an evening boat trip on the Seine to see Paris monuments illuminated, and a Sunday excursion to the Champagne districts.

Further information may be obtained by writing to: Societe D'Organisation De Congres Francais Et Internationaux (S.O.C.F.I.), 1 ter, rue Chanez, Paris-16.

Our Congress Exhibitors

Technical Exhibits

AMERICAN HOSPITAL SUPPLY CORPORATION
Evanston, Illinois

The opportunity to see and try out for yourself the new Tomac Magne-Typer—which allows paralyzed or semi-paralyzed patients to typewrite—is just one of many items to be offered at the booth of American Hospital Supply Corporation. American also invites you to examine the ease of operation of the Electro-Matic wheel chair and the Monaghan Ventalung. Other new developments in the rehabilitation field which will be on display include the Tomac Rocking Bed with Chest Shell Pump attached, versatile Polecat Equipment, Multi-Controller, Folding Walkers, and the Bennett Ventilation Meter.

AMERICAN RESTORATOR, INC.
New York, New York

The Restorator is a versatile and modern rehabilitation device which offers progressive active resistance therapy for the lower and upper extremities. The Restorator has many unique features, such as its attachability to either bed, wheel chair or straight chair, which allows even the most severely handicapped patient to have the required dose of active physical exercise. In addition, the Restorator allows a wide range of adjustments to fit individual requirements. Two models, a clinical Model H and a home Model 20 will be demonstrated. Both models have been clinically tested and approved and are widely employed by physicians and physical therapists.

ASSOCIATION CONVENTIONS EXHIBITS
New York, New York

"Publishers' Cooperative Exhibit" of books covering the medical and rehabilitative aspects of physical therapy, from the leading publishers in these branches.

BATROW LABORATORIES
Branford, Connecticut

Are you familiar with the recent advances in electrophysiology? Do you know that recent development and research with the Batrow Neuro-activator now enable you to accomplish many new technics with maximum safety, comfort, and efficiency? You are invited to see a demonstration of the Batrow Neuro-activator.

THE BIRTCHER CORPORATION
Los Angeles, California

The Birtcher Corporation will display its complete line of electromedical equipment. We will be represented in our booths by both our Sales and Engineering Departments. We are also very pleased to announce that our Export Manager, Mr. Sacha Bollas, will be present at the Congress to welcome his many friends.

S. BLICKMAN, INC.
Weehawken, New Jersey

S. Blickman, Inc. will show the COMPTON MODEL STAINLESS STEEL PACK TABLE used in the application of the wet sheet pack as a major sedative treatment in hydrotherapy; and a BRADDOCK MODEL stainless steel contrast leg bath for automatically hot and cold plunges. This unit is equipped with a thermostat mixer to set hot water to proper prescribed temperature for successful treatment. The GRAFTON MODEL stainless steel stool used in hydrotherapy departments will also be shown. All units are made of genuine stainless steel and are completely free from corrosion and impervious to wear.

THE BURDICK CORPORATION
Milton, Wisconsin

The Burdick Corporation will exhibit its modern line of Physical Therapy Equipment. Features of especial interest will be the Burdick Ultrasonic Therapy unit and modern line of Diathermy apparatus. Members are invited to register for the Burdick Syllabus, a periodical of abstracts on Physical Therapy.

S. H. CAMP AND COMPANY
Jackson, Michigan

The Camp exhibit will feature products widely used in treatment, plus their complete line of men, women, and children's supporting garments. You will be interested in the display of the latest developments in scientifically designed supports and improved orthopedic models, including Plastic Braces. Investigate how Camp can best meet your exacting requirements with patient comfort and their availability in the world.

CHATTANOOGA PHARMACAL CO., INC.
Chattanooga, Tennessee

Moist Heat easily applied. So effective, so simple to use. The HYDROCOLLATOR completely simplifies the application of MOIST HEAT. The Steam Pack is merely heated in water, wrapped in a towel, and applied. Each application gives at least 30 minutes effective moist heat—without any wringing or dripping, and without any repeating of applications. If you are not using the Hydrocollator, don't fail to visit our booth and request a thorough demonstration. If you are a Hydrocollator user, you will be interested in our new Model D-3 Master Unit—our answer to your many requests for a small, inexpensive Unit.

THE COCA-COLA COMPANY
New York, New York

Ice cold Coca-Cola served through the courtesy and cooperation of The Coca-Cola Bottling Company of New York, Inc. and The Coca-Cola Company.

CONITECH, LTD.
Chauncey, New York

In addition to the universally accepted Technicon-Huxley Chest-Abdomen Respirator, Conitect, Ltd., invites you to the first showing of a unique, versatile, and completely new concept of a respirator. With this new continuous-duty equipment, a patient can be respired

with a cuirass, by positive pressure, or by means of a pulsating abdominal belt which, in spite of its small size, can adequately ventilate the most debilitated adult patient. With this new respirator it is also possible, if necessary, to employ a combination of cuirass and positive pressure, or abdominal belt and positive pressure, for one patient.

COSMEVO MANUFACTURING COMPANY
Paterson, New Jersey

Cosmevo Manufacturing Company will display an impressive, full range of new, improved surgical and orthopedic appliances. This year, more than ever, these items reflect many exclusive and desirable features resulting from their highly advanced design. The major points about these specialized appliances are that they can be used immediately after surgery, in geriatric treatment, and in physical rehabilitation. These modern physical aids allow the physician to put his patients "back on their feet" much faster and enable the hospital to discharge patients sooner . . . safely! Every appliance on display is fully adaptable and easily adjustable to a wide range of patients.

DAKON TOOL AND MACHINE COMPANY, INC.
New Hyde Park, New York

Manufacturers of dependable hydrotherapy equipment for twenty years. Dakon Tool and Machine Co., Inc. offers the most diversified line of standard machines. Available in sixteen portable and stationary, single and dual motored models. Recently the above line was complemented by the introduction of a precision engineered ultrasonic machine for medical usage.

DALLONS LABORATORIES, INC.
Los Angeles, California

This year DALLONS LABORATORIES, INC. will display our latest group of Electro-Medical instruments. Besides our two Medi-Sonar Ultrasonic generators, we will demonstrate for the first time a meter to measure accurately the acoustic output of ultrasonic transducers. Our Ultra-Violet generators and Medi-Therm Diathermy will be displayed with two completely new Medi-Sine Muscle Stimulators.

C. D. DENISON ORTHOPAEDIC APPLIANCE CORPORATION
Baltimore, Maryland

To the members and guests of "The Second Congress of the World Confederation for Physical Therapy" we extend our wishes for a successful meeting, with continued success and growth through the coming years. We would like to introduce to you some of the successful and growing developments in cerebral palsy braces and apparatus, by inviting you to stop at our booth. Here you may see and test the results of our developments. We hope that through our meeting many problems which you may have in the treatment of cerebral palsy patients may be lessened if not eliminated.

DENOYER-GEPPERT COMPANY
Chicago, Illinois

Denoyer-Geppert Company will exhibit visual teaching aids which are of special interest to physical therapists. Unbreakable plastic anatomical models will be featured along with an excellent selection of large, colored wall charts and fine skeletal preparations. Company representative will be on hand to demonstrate samples.

DIREKT-FORM CORP.
New York, New York

ELGIN EXERCISE APPLIANCE COMPANY
Elgin, Illinois

You are cordially invited to inspect THE ELGIN EXERCISE UNIT, and other EXERCISE UNITS. These devices are specifically designed and developed, in a scientific manner, to meet the many and varied problems of remedial exercise therapy. The doctor and physical therapist has available the proper clinical tools with which to administer a great variety of exercises to both the surgical and nonsurgical patient. Simple functional exercises to the most highly definitive focal exercises may be performed with this equipment. Our representatives in attendance will be glad to supply literature and complete information.

EVEREST & JENNINGS, Inc.
Los Angeles, California

A display of modern wheel chairs featuring the latest developments in the equipment for the handicapped. Everest & Jennings is featuring the new power drive electric wheel chair and a completely new line of Hollywood Wheel Chairs.

H. G. FISCHER & CO. and TECA CORPORATION
Glendale, California

Latest models of Modern F.C.C. approved Ultrasonic Generators, Short Wave Diathermy Units, Low Voltage Generators and Equipment for Electrodiagnosis, all of highest quality materials and construction will be on display. Representatives in attendance will welcome an opportunity to give demonstrations and quote today's low prices. Your visit will be appreciated.

THE FRANKLIN HOSPITAL EQUIPMENT COMPANY
Newark, New Jersey

A subsidiary of the Franklin Machine Company, manufacturers of the S-100 Mobile Arm Sling Suspension, the T-101 Tilt Table, and recently completed design work on a Finger Exerciser. We manufacture hospital equipment for use in departments of Physical Medicine and Occupational Therapy, and Rehabilitation work in general. We are represented by the American Hospital Equipment Company, Acme-Abbey Rents, Scully-Walton, and many others. It is a pleasure to have this opportunity to exhibit and demonstrate our equipment to those interested. Our Tilt Table and Arm Sling Suspension will also be on exhibit.

HILL LABORATORIES COMPANY
Malvern, Pennsylvania

Hill Laboratories Company will exhibit and demonstrate the HILL TRACTION TABLE equipped for any type of traction desired, and the MOBILE HILL APPLICATOR for dry or moist heat automatically controlled to less than .25°F. and to give temperatures from 90°F. up to 140°F.

ILLE ELECTRIC CORPORATION
Freeport, L. I., New York

HYDROMASSAGE SUBAQUA THERAPY EQUIPMENT: Ille Electric Corporation will demonstrate the use of Hydromassage Subaqua Therapy Tanks. They will display the Full Body Immersion Hydrotherapy Unit, Combination Arm, Leg, and Hip Whirlpool Bath with Mobile Adjustable High Chair, Paraffin Bath, and Mobile Sitz Bath.

INVALID WALKER AND WHEEL CHAIR COMPANY
Long Beach, California

Manufacturers of the most complete line of convalescent and invalid adjustable-mobile Walkers in the world. INVALEX LINE: Rigid Walkers—infant, baby, junior, and adult sizes; Folding Walkers—junior and adult sizes; Cerebral Palsy Walkers—baby and junior sizes. CALIFORNIA LINE—Walker-Chair combination: Malibu Folding—junior and adult sizes; Laguna Rigid—junior and adult sizes; Manhattan Stroller—adult size only: Also manufacturers—fracture frames, trapeze bars, commode chairs, bedside tables, footstools and bed siderails.

KENNEDY VETERANS ADMINISTRATION HOSPITAL
Memphis, Tennessee

AMBUL-AID invalid training walker is newly designed and functional. Its all aluminum construction features lightness, strength, durability, attractiveness, resistance to corrosion, maximum stability and low maintenance cost. Adjustments provide for pre-crutch training, change of height from 4′ 6″ to 6′ 6″. Each wheel swivels, each wheel locks in parallel position and wheel brakes are foot controlled. It is designed for use on normally smooth surfaces. AMBUL-AID wheel chair coupler may be easily attached to all metal wheel chairs and provides for transporting two wheel chair patients tandem style. By pushing the new wheel chair, attendant can easily control and maneuver front wheel chair.

KUHNEN THERAPEUTIC EQUIPMENT
Morristown, New Jersey

KUHNEN—leading producers of specialized equipment for handicapped children—proudly presents their new line of fully adjustable therapeutic furniture and walking aids. Relaxation chairs, standing tables, cut-out tables, reciprocal motion skis, standing stabilizers, parallel bars, KUUHNEN crawlers, foot placement ladders, and a selection of aluminum canes, crutches, and crab crutches.

LA BERNE MANUFACTURING COMPANY, INC.
Columbia, South Carolina

LaBerne Manufacturing Company will exhibit several new items in addition to their WALK-OFF table and Parallel Bars. New items will include an adjustable overbed Shoulder Wheel. This wheel is built to be used with bed-ridden patients over their beds or in wheel chairs. It is mounted on casters and is adjustable to any degree of height and to any angle of circular motion. Another new item shown is a Resistance Exerciser which offers a new field in resistive exercises.

LEVINTHAL ELECTRONIC PRODUCTS, INC.
Redwood City, California

Levinthal Electronic Products, Inc. will present Varitrak, a new machine for cyclic and intermittent traction. Unit imparts up to 50 pounds pull 3 times per minute, therapy shown in recent literature as most effective in whiplash injuries and similar problems. Mounts by detachable bracket to wall, table, or hospital bed for both vertical and horizontal traction on either ambulatory or bed cases.

LIEBEL-FLARSHEIM COMPANY
Cincinnati, Ohio

The Liebel-Flarsheim Company cordially invites you to visit the booth in which their latest electromedical equipment will be exhibited. Capable representatives will be on hand at all times.

PAUL J. MANDABACH, INC.
Chicago, Illinois

Headquarters for information on uses and distribution facilities of physical medicine and rehabilitation equipment, machines, furniture, instruments, accessories and supplies for use in the clinic, laboratory, workshop and other special rooms and departments. Specifically: Anatomical charts, monographs, books and record forms; electronic muscle stimulators; vaginal, rectal and other electrodes; diathermy; ultrasonics; air conditioning; signals, tables, beds, and stretchers; floor maintenance; uniform gowns; splints, crutches, anatomical supports; adhesives; antiseptics, disinfectants, germicides, and deodorants. Whatever you want we can tell you where and how to get it. Register at Booth 67 for a free shopping bag.

MEDCO PRODUCTS COMPANY
Tulsa, Oklahoma

The MEDCOLATOR Stimulator, for the stimulation of innervated muscle or muscle groups ancillary to treatment by massage, is a low volt generator that will generate plenty of your interest. Electrical muscle stimulation is a valuable form of rehabilitation therapy. Be sure to visit our booth for a personal demonstration.

MEDCRAFT ELECTRONIC CORPORATION
Babylon, New York

Medcraft will exhibit its new Electromyograph, embodying developments bringing this instrument for the first time to a level usable in clinical work. Also on display will be a new ultrasonic therapy unit of unique design. Technical representatives will be on hand to demonstrate.

MURKA MANUFACTURING COMPANY
Dayton, Ohio

Will present the new Re-Mobilization Tilt Table designed for a dynamic physical therapy program. Not only a back saver for therapists but the only electric tilt table that provides supine or prone procedure for early ambulation; adjustable time delay for intermittent oscillation; and traction from ten seconds to three minutes—manual or automatic traction sustained or intermittent from 0 to 300 pounds cervical or spinal. In the care and treatment of the severly handicapped patients this multifunctional Re-Mobilization Table is practically indispensable. Equipment includes adjustable footboard, newly designed traction belt, traction bar, head sling, and spreader bar.

NATIONAL STEEL PRODUCTS COMPANY
Los Angeles, California

ORTHOPEDIC EQUIPMENT CO.
Bourbon, Indiana

PORTO-LIFT MANUFACTURING CO.
Lansing, Michigan

The original producer of invalid lifting equipment, pioneered the development of bed patient transfer facilities. The sturdily constructed PORTO-LIFT is completely mobile, utilizing easy to operate hydraulic action that eliminates physical strain on attendant . . . ensures smooth and comfortable patient transfer from bed to wheel chair, conventional chair, automobile and bath.

J. A. PRESTON CORPORATION
New York, New York

Offering the only complete line of equipment and books for Physical Medicine and Rehabilitation. Shown are selected items of REHABILITATION EXERCISE EQUIPMENT; Self-Help devices for Activities of Daily Living; a variety of special equipment for Cerebral Palsy; DIAGNOSTIC APPARATUS; and Low Volt Generators. Also shown will be the GUTHRIE-SMITH Sling Suspension Apparatus, and several new items. Our service for new departments is also at hand to serve you. *Register for your Free Copy of our Illustrated Catalog.* Our EXPORT DEPARTMENT ships equipment to all countries. Prompt and expert service guaranteed to all parts of the world.

RAYTHEON MANUFACTURING COMPANY
Waltham, Massachusetts

Electronic and Ultrasonic pioneering and a vigorous program of investigation and development have resulted in the Raytheon Microtherm and Ultrasonic therapy equipment. This tried and proven modern equipment should be a must on your "See List." Plan your busy schedule to include a demonstration. Factory representatives will be on hand to answer your questions.

REHABILITATION EQUIPMENT INC.
New York, New York

Remco: Better equipment for Physical Medicine includes the latest devices for the rehabilitation of the physically handicapped. See the new Adjustomatic Standing Table, Parallel Bars, Shoulder Wheels, Resistive Exercise Equipment, Aids for the Activities of Daily Living and Cerebral Palsy Equipment.

THE RIES CORPORATION
Pittsburgh, Pennsylvania

MOISTAIRE heat therapy equipment produces a heated environment of air saturated with water vapor, based on the principle of dew point control. It has been found to hasten convalescence of many common disabilities. This physiologically sound and safe precedure increases the volume of local blood flow measureably. It aids in the prevention of adhesions, lesions, muscle spasms, and produces local analgesic effects, thus making other treatment procedures acceptable to the patient. It has been used consistently since 1937 and found most valuable in the treatment of acute and chronic back sprains, fractures, fibrositis, synovitis, bursitis, and other industrial and orthopedic problems.

SCIENTIFIC EQUIPMENT MANUFACTURING CORP.
New York, New York

Figuring importantly among the products exhibited at the Second Congress of the World Confederation for Physical Therapy, will be Whirlpool Baths, Short Wave Diathermy and Ultrasonic Generators of World Wide Electronics, Incorporated. World Wide Electronics, Incorporated, a division of Scientific Equipment Manufacturing Corporation, both of New York City, are the designers and makers of the widely known and accepted "Precisioneered" diagnostic and electrotherapeutic equipment and appliances.

C. M. SORENSEN COMPANY, INC.
Woodside, L. I., New York

Exhibiting the Schroeter Whirlpool Carriage—the original portable apparatus for partial or complete body hydrotherapy in any bathtub. Adjustable for height, direction and force of flow, the unit is safe, adaptable, and may be handled by a child.

TECA CORPORATION & H. G. FISHER & COMPANY
White Plains, New York

Latest models of modern F.C.C. approved Ultrasonic Generators, Short Wave Diathermy Units, Low Voltage Generators and Equipment for Electrodiagnosis, all of highest quality materials and construction, will be on display. Representatives in attendance will welcome an opportunity to give demonstrations and quote today's low prices. Your visit will be appreciated.

TRANS WORLD DEVELOPMENT & MANUFACTURING CORP.
Houston, Texas

We wish to extend an invitation to all attending the Second Congress of the World Confederation for Physical Therapy to visit our booth. It is a pleasure to present to you a complete new line of rehabilitation equipment. It is designed to give you maximum versatility, accuracy, and durability with an absolute minimum of maintenance. We offer a new concept in design and engineering and a new scope of technics for your rehabilitation patients.

THERMO-ELECTRIC COMPANY
Cleveland, Ohio

Dickson Paraffin Baths, pioneered and developed in cooperation with Cleveland Hospitals, have been in continuous operation for 15 years. Noteworthy features are—mahogany mouldings for comfort of patients: double control of melting element insuring maximum safety. Maintenance is practically nil, proving the efficiency of the units. Drain tube capacity increased in late models BB and E.

VARO-MET, INC.
Chicago, Illinois

The VARO-MET CEREBRAL PALSY CHAIR-BRACE is a training aid for the cerebral palsy patient. It is designed to help teach head balance, sitting balance, and use of hands. These skills must be learned well before the

child can learn to walk. This Chair-Brace is a valuable training aid. It supports and permits effective, safe, control of the child during this early stage of training. Training manuals are available at our booth.

JAY L. WARREN, INC.
Chicago, Illinois

Well-known manufacturer of Gated Compression Auditory Training Units, has recently introduced a complete line of therapeutic furniture and equipment. With the assistance of many of the nation's foremost doctors and therapists, the design of WARREN Therapeutic Furniture represents the most advanced thinking in the fields of occupational and physical therapy, speech departments, adult rehabilitation, and practical home use equipment. The almost infinite number of graded adjustments designed into WARREN Therapeutic Furniture assures proper "fit" to the patient and freedom from obsolescence. Catalog B555 illustrates and describes the complete line of WARREN Therapeutic Furniture and Equipment.

THE WHITEHALL ELECTRO MEDICAL CO., INC.
Passaic, New Jersey

You are cordially invited to visit the Whitehall Booth to view our exhibit of Hydrotherapy Equipment. Our representative will be glad to demonstrate the Whitehall "One Motor" Mobile Whirlpool Bath. This unit is equipped with a turbine assembly that functions as both agitator and emptying device—two operations, i.e., agitation and emptying, are combined into a single motor driven system. Special plumbing is not necessary to install this unit. Information concerning the Whitehall Full Body Immersion (Hubbard) Tank will also be available at this meeting. Our representative will also be on hand to discuss any particular questions you may have regarding Hydrotherapy Equipment.

ZIMMER MANUFACTURING COMPANY
Warsaw, Indiana

Zimmer Manufacturing Company will exhibit the Newman Myometer, a new device for measuring muscle strength; and the Hausted Traction Machine which applies smooth hydraulic traction, steady or intermittent, has precision timing, automatic compensation for movement of patient, is electronically controlled, and may be used to apply either cervical or pelvic traction from 0 to 100 lbs; as well as many other items for use in physical therapy.

Scientific Exhibits

ARMY MEDICAL SPECIALISTS CORPS., DEPARTMENT OF THE ARMY
Washington, D. C.

"Restitution of Function Following Hemiplegia" shows:

1. The pathologic physiology of the hemiplegic posture by diagrams depicting alterations in the relaying of incoming impulses at the spinal synapse;
2. Patterns of motor return both spontaneous and under treatment broken down to show the following three major impediments to recovery—postural hyperactivity, dyssynergies, and proximal paresis;
3. Factors which influence recovery—selective reeducation, curtailed ambulation, nerve conduction "blocks," and operative procedures.

THE ARTHRITIS AND RHEUMATISM FOUNDATION
New York 36, New York

"The Arthritis and Rheumatism Foundation" tells of its aims, accomplishments and special services for professionals, including Home Care Manual, Arthritis Clinic Manual, and Nurses Manual.

ASSOCIATION FOR THE AID OF CRIPPLED CHILDREN
New York 17, New York

"Association for the Aid of Crippled Children" devotes itself to research into causes of crippling diseases, professional education, public education, and demonstrations in rehabilitation of handicapped children and youth. The scope of the Association's program is: The support of basic research into causes of prematurity, birth injury, congenital malformations, and other handicapping conditions; stimulation of professional education and coordination of research; aid in understanding rehabilitation; and consultation on programs and research. Demonstrations in new patterns of rehabilitation and service, plus publications, complete the program.

BIOPHYSICS RESEARCH LABORATORY
Washington, D. C.

"Electro-Myodynagraphic Technics and Data." Photographic illustrations of selected methods for positioning normal subjects and patients with various types of disabilities in obtaining objective recordings of muscular tensive forces. Statistical charts illustrate results from a variety of technics employed and graphic recordings demonstrate patterns of responses obtained in evaluating different attributes of muscular dynamics. The exhibitor's Electronic Myodynagraph is on display, with opportunity for visitor participation in recording tensive forces of ankle plantar flexion.

CHILDREN'S BUREAU, DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Washington, D. C.

"Children's Bureau Publications" displays publications for parents and for professional workers in the fields of child health and child welfare.

THE CANADIAN ARTHRITIS AND RHEUMATISM SOCIETY
Toronto, Canada

"The Canadian Arthritis and Rheumatism Society and its Home Treatment Program" consists of a display by means of photographs of the work of the Society in its home treatment program. Backdrop: A film strip with sound, outlining in approximately 20 colored pictures, the story of the mobile physical therapy unit. Graphic charts of statistical information regarding case loads.

GEORGIA WARM SPRINGS FOUNDATION
Warm Springs, Georgia

"Orthetics—Designed For Function" consists of four panels. Panel 1 will show various basic ortheses for the upper and lower extremities. Panel 2 will show basic "feeder" type ortheses. Panel 3 will show basic adapted ortheses, and panel 4 will show ortheses for the trunk.

HIGHLAND VIEW CUYAHOGA COUNTY HOSPITAL
Cleveland 22, Ohio

"Highland View Cuyahoga County Hospital." The staff of the Department of Physical Medicine and Rehabilitation has participated in many home evaluations for patients, preparatory to their discharge home. A half-scale model of a kitchen, bathroom, and combination living room and bedroom is exhibited to show how the home can be adjusted to different disabilities of patients to enable them to live as independently as possible.

INSTITUTE OF PHYSICAL MEDICINE AND REHABILITATION, NEW YORK UNIVERSITY-BELLEVUE MEDICAL CENTER
New York, New York

"Devices Used In Rehabilitation." The purpose of this exhibit is to show a representative selection of devices for training patients in Activities of Daily Living and therapeutic exercises. The devices were selected to illustrate the following factors.

1. Simplicity of design
2. Adaptability to different disabilities and activities
3. Adjustments for severly involved patients

These devices constitute an important aspect of the patient's rehabilitation. The technic and methods involved in the use of devices form an integral part of the extensive teaching program which is available at New York University-Bellevue Medical Center, Institute of Physical Medicine and Rehabilitation, to students from all parts of the world.

MEDICAL SPECIALISTS CORPS., DEPARTMENT OF THE AIR FORCE
Washington, D. C.

"The Role of the Physical Therapist in the United States Air Force Medical Service" exhibits by use of transparencies, typical activities of United States Air Force Physical Therapists located in Alaska, England, Germany, Japan and the Philippines.

MUSCULAR DYSTROPHY ASSOCIATIONS OF AMERICA, INC.
New York 6, New York

The exhibit of the Muscular Dystrophy Associations of America, Inc., is in three panels. The left panel shows what muscular dystrophy does. The center panel consists of a screen behind which is an automatic projector that shows a series of 12 color slides—in rotation. (One set shows physical therapy in the home; the other set shows the physical manifestations of the disease.) The right panel deals with common forms of muscular dystrophy, onset, course and direction, and with differential diagnosis.

THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS
New York 5, New York

"Rehabilitation of Poliomyelitis Patients With Respiratory Involvement" outlines through the use of dramatic pictures, rehabilitation procedures adapted to enable a patient with severe upper extremity involvement as a result of respiratory poliomyelitis to return to the care of her home and children. The pictures illustrate hospital treatment, the adapted equipment used at home and the scope of her activities at home and in the community.

NATIONAL LEAGUE FOR NURSING, INC.
New York 16, New York

"National League for Nursing." A membership organization for all concerned in improving the nursing care of people. To implement this, there are state and local Leagues which include public-spirited citizens, nurses, and agencies concerned with health. Representing us at this Congress is the Nursing Advisory Services for Orthopedics and Poliomyelitis. Its activities include focus upon curriculum development by integration of the basic principles of orthopedic nursing with schools of nursing and development of inservice education programs pertaining to the rehabilitative aspects of nursing with public health nursing services. Materials are available in the booth depicting the activities of the organization.

THE NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS, INC.
Chicago 3, Illinois

"Rehabilitation Literature—Library Service of the National Society for Crippled Children and Adults" exhibits how greater interest in the treatment and welfare of the handicapped has been reflected in the growing number of new publications in physical therapy and related disciplines. *Rehabilitation Literature*, the monthly abstracting indexing service of the Library of the Society, systematically reviews the professional and nontechnical literature. This service will be featured in the exhibit and will be explained by the Librarian who will be in attendance. The busy physical therapist whether he be clinician, educator, or student will find it a means of keeping informed of new developments in all areas of rehabilitation and allied fields. The other services of the Library and Society that will be of help in planning and providing services for the handicapped will also be presented.

NEW YORK STATE REHABILITATION HOSPITAL
West Haverstraw, New York

"Safety: A Factor in Functional Training of the Disabled Child" emphasizes the importance of proper body mechanics in functional training where a therapist is called upon to perform stooping, lifting, carrying, pushing, pulling, and reaching as well as "spotting" the disabled child through hazardous movements. These fundamental movements underlie the activities used in the teaching of functional training as well as the therapist's daily work performance. The factors of stability which involve proper body balance as described and illustrated in the exhibit are: 1. Center of Gravity, 2. Base of Support, 3. Line of Gravity, and 4. Weight.

These principles if properly applied in functional training will safeguard both the patient and the therapist.

OFFICE OF VOCATIONAL REHABILITATION, DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Washington, D. C.

"New Hope for the Disabled." A delineation of goals and new opportunities for expansion of the program of vocational rehabilitation of disabled civilians implicit in the 1954 Amendments to the Vocational Rehabilitation Act. The exhibit consists of six panels of photographs, art work, and text.

ORTHOPAEDIC HOSPITAL
Los Angeles 7, California

"Aids in the Therapeutic Use of Pools." Pool therapy is indicated for patients with a fascial, muscle, ligamentous, or joint disability and is not limited to the patient with a local, partial, or complete paralysis. The addition of floating and stabilizing aids to the usual pool equipment makes it possible to treat the patient on the table, in the upright weight-bearing position, or while partially or freely floating. Their buoyancy also affords a means of resistant exercise. This exhibit includes many of these floating and stabilizing aids with photographs demonstrating their use with the patient and show how greatly they broaden the scope of pool therapy.

PHYSICAL THERAPY REVIEW
New York, New York

The growth and development of the *Review* from 1921 to 1956 will be shown on a poster with cover reproductions, circulation figures and a world map. Copies of the June (Congress) issue will be available and the Cumulative Index of the *Review* from 1940 through 1954 as well as the special issue on Rehabilitation published November, 1955.

PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Washington, D. C.

"The Treatment of Leprosy at the U. S. Public Health Service Hospital, Carville, Louisiana" pictorially shows the physical plant and facilities, clinical and rehabilitation services, and community activities which comprise the total program of the U. S. Public Health Service Hospital at Carville, the only hospital in the continental United States devoted exclusively to the care and treatment of patients with leprosy.

UNITED CEREBRAL PALSY
New York, New York

"Complete Program Planning for the Cerebral Palsied" presents the eleven vital steps of a complete program of care for the cerebral palsied, a program contingent upon the cooperation of the various disciplines of therapy, the physician and community health officials as well, for its effectiveness.

UNITED NATIONS, REHABILITATION UNIT
New York, New York

VETERANS ADMINISTRATION
DEPARTMENT OF MEDICINE AND SURGERY
Washington, D. C.

"Progress in Prosthetics" shows latest developments in upper and lower extremity prosthetics. Included will be an armamentarium of components available for artificial arms at different levels, as well as various types of conventional leg prostheses. Experimental models and technics will also be displayed.

WORLD CONFEDERATION FOR PHYSICAL THERAPY

A large World Map will be displayed showing the distribution of physical therapists in the member organizations of the Confederation and areas of the World where physical therapists have given service. Pamphlets and brochures giving information about the member organizations will be available.

New Student Members

Boston University

Joyce Curhan

Bouvé-Boston School

Ruth Nelson Judith Buliung
Priscilla Perkins

College of Medical Evangelists

Darlene Hammer Charles Bublin

New York University

Janet Greenburg

University of Connecticut

Craig A. Barnes Carol Emerick
Brenda Bellavigna Herbert Libby
Charles Chafee Patricia Long
Angelo DeScisciolo Patricia Sarrau
Linda Schay

University of Minnesota

Gordon L. Graham Thomas Markovich

University of Pennsylvania

Warren Van Arsdalen Jr.

Patients Enjoy Music

Highland Park Hospital, Highland Park, Illinois, has recently installed FM radio ear phones in the physical therapy department. Patients relax to music while receiving traction, applications of dry and moist heat, and during certain exercise procedures.

Association Activities

Mrs. Isabelle Knopping Lazin of Sharon, Massachusetts, passed away recently. Mrs. Lazin received the certificate in physical therapy at Walter Reed Hospital where she served for two years. She later was a member of the staff of Mt. Sinai Hospital in Chicago and most recently was chief physical therapist at Beth Israel Hospital, Boston, having resigned this position in 1955. Mrs. Lazin was an inactive member of the Massachusetts Chapter.

Marriages

Elizabeth Buschow, of Cleveland, Ohio, to Joseph Klimek, Cleveland.

Donna W. Cook, of Washington, D. C., to David F. Daley, Alexandria, Va.

Ruth Cortelyou, of Princeton, New Jersey, now Mrs. Ruth C. Sincak, Princeton.

Phyllis Cove, of Auburn, Mass., to Paul Wilson, Albuquerque, New Mexico.

Charlyn Croninger, of Ada, Mich., to Roger J. F. McMahon, Oscoda, Mich.

Ella D. Dampier, of Arlington, Va., Now Mrs. Ella D. Kemp, Arlington.

Ellen Jane Findley, of San Diego, Calif., to James E. Scott, San Diego.

Judy Fortenbacher, of Asheville, N. C., now Mrs. Judy F. Couture, Asheville.

Arlene Hendricks, of Fairfield, Conn., now Mrs. Arlene H. Ollayos, Fairfield.

Rosella Jones, of Camden, N. J., now Mrs. Rosella J. Calhoun, Philadelphia, Pa.

Shanna L. Jones, of Salt Lake City, Utah, to George E. Oswell, San Diego, Calif.

Joan Loewe, of New York, N. Y., now Mrs. Joan L. Rubin, Hartsdale, N. Y.

Donald Satterlee, of New York, N. Y., to Betty Inman, Perry, Fla.

Elaine Stowell, of Santa Rosa, Calif., now Mrs. Elaine S. Hurst, Santa Rosa.

Mary Jo Wright, of Kansas City, Mo., now Mrs. Mary Jo Martin, Kansas City.

Review Editorial Reprinted in *Trustee*

"Neglect Costs More than Rehabilitation," a guest editorial by Howard A. Rusk, M.D., which appeared in the November 1955 issue of the *Physical Therapy Review*, was reprinted in the January, 1956, issue of *Trustee*, the journal for hospital governing boards, published by the American Hospital Association.

Mildred Elson, Guest Editor

The April 1956 issue of *Hospital Management*, the journal of hospital administration, is devoted to the subject of rehabilitation. Charles U. Letourneau, Editorial Director of *Hospital Management* and former member of the Association's Advisory Council, invited Miss Elson to write an editorial for the rehabilitation issue.

The editorial points up the need for physical therapy departments, the need for qualified personnel, the role of and services provided by the American Physical Therapy Association, and that a physical therapy department can be a very good investment for the hospital.

Second Congress Fund Contributions

Northeastern District, Ohio Chapter	$ 15.00
Eastern District, Tennessee Chapter	7.50
Middle District, Tennessee Chapter	7.50
Kentucky Chapter	50.00
Louisiana Chapter	30.00
Minnesota Chapter	23.00
Rhode Island Chapter	12.00
Texas Chapter	14.50
South Dakota Chapter	13.00
Oklahoma Chapter	20.00
New Jersey Chapter	100.00
Northern California Chapter	1,000.00
Wisconsin Chapter	49.00
Beata M. Carlson	5.00
Bellevue Hospital Physical Therapists	12.00
Washington State Chapter	79.00
Maryland Chapter	9.00
Theresa Lanna	10.00
Martha E. Schmalenbeck	1.00
Iowa Chapter	44.00
Southern California Chapter	3.00
Arizona Chapter	17.00
Sargent College Physical Therapy Club	30.00
Southern Minnesota Chapter	12.00
William T. Green, M.D.	25.00
West Virginia Chapter	26.00
Utah Chapter	15.00
Idaho Chapter	8.00
Eastern District, Michigan Chapter	80.00
Dorothy Richards	1.00
Mississippi Chapter	35.00
Rose Gaughran	1.00
Virginia Chapter	26.00
Total to date	$6,267.54

Advisory Committee on Chapter Activities

Can we, as a chapter of the APTA, insert a listing of our chapter members in the Classified Section of the telephone directory? How can we make the most effective distribution of our chapter directory when we are "broke" and have no funds for mailing? How can we supplement our chapter's treasury?

These and other questions and problem situations submitted by the chapters were discussed by the Advisory Committee on Chapter Activities at its meeting February 16-18 in New York. As you know, this Committee was created by action of the Board of Directors in 1954 to serve in an advisory capacity to the Chapter and Membership Department of the National Office.

One of the purposes of the Committee is to receive, discuss and give guidance on problems submitted by the chapters and to help them find answers to specific questions which inevitably arise in the conduct of chapters' affairs. Meetings of the Committee are usually held in January or February. Have your secretary keep a list throughout the year of items on which you would like to have Committee opinion. Dates of the Committee meetings are announced through the Chapter Bulletins. Have your questions ready, discuss them at your chapter meetings; if you are unable to reach a decision, or want confirmation of your decision, your Advisory Committee is prepared to help you.

The Committee is made up of members of representative chapters with consideration given to size and geographical location. Chapters represented on the Committee at the present time are: Oregon (Elizabeth Fellows), Colorado (Katherine Chilcote), Kentucky (Melvin Carson II), New York (Dorothy Schumer), District of Columbia (Barbara White, Chairman). As each Committee member has demonstrated leadership in the conduct of his chapter's affairs, the group is one with widespread interests, opinions, and experiences.

Are you bored with long, drawn-out executive committee and business meetings? Last year the Committee made suggestions for a revision of the Chapter Manual. The National Office staff has done a superb job of revision. The new Manual is now in the hands of chapter presidents and secretaries. It will help chapters to develop a strong organizational framework whereby more business can be accomplished in less time. It is clear, concise — an easy reference. And furthermore, it's interesting reading. We trust it will have constant usage in your chapters.

We should point out that the Manual is not in final form. It has been sent to the chapters for "proving." Please use it for a period of time and then send us your suggestions for revisions as well as comments on the sections that have been particularly helpful. We need your opinions to make it of the greatest possible use to you.

How many of you have labored over chapter report forms and compilations of annual report forms? You will be cheered to know that these, too, underwent revision. We were fortunate to have our national Secretary attend some of our meetings and help us with these. Her suggestions and assistance were invaluable in our attempts to streamline the report forms and still have them meaningful for the House of Delegates, the Board of Directors, and the National Office staff.

Do you sometimes wonder what the Association is doing? The *Review*, of course, is one of the best sources of information. Another is the Chapter Bulletin. Items are presented for your information, and in some instances, action. Material contained in the Bulletins should be presented and fully discussed in your chapter meetings. Perhaps, in addition, your chapter officers could arrange to have them circulated during your meetings or otherwise make them available for review by all members.

What can you do to help the recruitment program? Watch for the excellent suggestions our recruitment consultant gives in each issue of the *Review*. One of the needs discussed by the Committee was how to get human interest stories. Don't be bashful. If your own "story" would make good "copy" (if not in your opinion, in that of your friends), give! We, as physical therapists, have varied backgrounds, interests, experiences, and really exciting stories to tell. The chapters can help to tap this resource for recruitment.

What are the other chapters doing? The Committee reviewed the reports of the chapter workshops of the last two years. In these reports there is a wealth of material on the conduct of chapter affairs. Undoubtedly your chapter has been represented at one or both of the workshops. It might be well to ask your representative to review, from time to time, some of the items discussed. Like the Chapter Manual and the Bulletins, Workshop Summaries should be a ready

reference to stimulate the "How can we —," and the "What should we be doing —" discussions.

The Committee discussed these and many other items during its three-day meeting. Items presented to the Committee by the Board of Directors and the Judicial Committee were acted upon and recommendations were made. Programs and activities of the Departments of Professional Services, Professional Education, and Recruitment were reported and discussed. And impressive these reports are. If you aren't going to be lucky enough to hear them at the annual House of Delegates meeting in New York, be sure to read them in the *Review*. All, of course, relate directly to chapter and membership interests. And the chapter and membership interests are the direct interest of the Advisory Committee on Chapter Activities. The Committee is ready to be of help to you in your chapter work.

BARBARA WHITE, *Chairman*

Army Medical Service Presents Brochure in National Reserve Week Observance

The Army Medical Service observed National Reserve Week with the presentation of the first copy of a brochure entitled, "Today's Decision, Tomorrow's Reward" to Mrs. Dwight D. Eisenhower by Col. Inez Haynes, Chief of the Army Nurse Corps.

The brochure, containing information pertaining to the Reserve program of the Army Nurse Corps and the Army Medical Specialist Corps, is designed to inform professional nurses, physical therapists, dietitians, and occupational therapists of the need and opportunities in the Reserve. Copies of "Today's Decision, Tomorrow's Reward" may be obtained from the Surgeon at each Army Headquarters.

Participating in the ceremony at the White House are, left to right, Major General P. D. Ginder, Special Assistant to the Army Chief of Staff for Reserve Components; Colonel Haynes, Mrs. Eisenhower, and Colonel Harriet S. Lee, Chief, Army Medical Specialist Corps.

Member's Article in *Military Medicine*

"The Role of Dietitians, Physical and Occupational Therapists in the Management of Mass Casualties" by Colonel Harriet S. Lee, AMSC, USA, appears in the April 1956 issue of *Military Medicine*. Colonel Lee presented this paper at the 62nd Annual Convention of the Association of Military Surgeons of the United States in Washington, D. C., November 7-9, 1955.

APTA-OVR Institute

Sixteen school directors, and 32 instructors representing 33 of our approved schools and Marquette University and Ohio State University (currently awaiting approval) met at the Extension Study Center of the University of Oklahoma, Norman, Oklahoma, the week of April 15 to participate in the Institute on the Correlation of Physiology with Therapeutic Exercise. The Institute was made possible through a grant of $10,000 from the U. S. Office of Vocational Rehabilitation, Department of Health, Education and Welfare, supplemented by funds from the Association.

Classes were held from 9 A.M. to 5 P.M. each day, with evening sessions devoted for scientific film showings, visits to the School of Physical Therapy at the University, the Veterans Administration Hospital in Oklahoma City, the Research Institute, and the Crippled Childrens Hospital. On the lighter side the participants had an informal social hour with the Oklahoma Chapter, and made visits to the University's Observatory and the Folklore Museum.

Subjects presented included the following: Exercises for Improvement of Strength, Exercises for Endurance, Range of Motion, Volitional Movement, Methods Used to Elicit and Reinforce and Coordinate Muscular Response, and the Physiological Bases for each subject area. Educational experiences were provided through: lectures, use of visual aids, small group discussions, general discussions, problem clinics, panel discussions and audience participation.

The success of the Institute can largely be attributed to the contributions of the following instructional staff:

Edna M. Blumenthal, Director of Rehabilitation, North Carolina Cerebral Palsy Hospital, Durham

Signe Brunnstrom, Consultant in Amputee Training, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center; and Instructor, Courses in Physical Therapy and Occupational Therapy, Columbia University, New York

Ernst Fischer, M.D., Professor of Physiology, Medical College of Virginia, Richmond

Sara Jane Houtz, Research and Educational Consultant, Detroit Orthopedic Clinic, Detroit

Florence Kendall, Private Practice, Baltimore

H. J. Ralston, Ph.D., Professor of Physiology, University of California, College of Physicians and Surgeons, San Francisco

Laura Smith, Physical Therapy Supervisor, and Director of Educational Programs, Southwestern Poliomyelitis Respirator Center, Houston

Chairman of the Institute Planning Committee was Mary E. Kolb of the D. T. Watson School of Physiatrics, Leetsdale, Pennsylvania, and included were Margaret Kohli, Physical Therapy Director of the Course in Physical Therapy at the University of Wisconsin, and Helen Kaiser, Physical Therapy Director of the Division of Physical Therapy at Duke Hospital.

Chapter News

Iowa

At the annual meeting held in Sioux City, a Western District of the Iowa Chapter was formed. The meeting was attended by members and guests from Iowa, South Dakota, Illinois, and Nebraska.

Illinois

The February Illinois Chapter Newsletter contains two interesting reports on chapter affiliation with other organizations.

For several years the chapter has been a member of the Health Division of the Welfore Council of Metropolitan Chicago and of Women's Share in Public Service.

Glossary of Terms in Cerebral Palsy Available

Helen Spencer, Instructor in Physical Therapy, Department of Physical Medicine and Rehabilitation, College of Physicians and Surgeons, Columbia University, 630 West 168th Street, New York, N. Y., has compiled "A Glossary of Scientific Terms in the Field of Cerebral Palsy." The courses for which the material was compiled and its publication were supported by the United Cerebral Palsy Associations, Inc. Copies are available without charge to students and professional workers. Requests should be sent to the above address.

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Abstracts

Role of the Orthopedic Surgeon in Treatment of Cerebral Palsy

Frederic C. Bost and Warren J. Kelley, J. A. M. A., 160:256-258, Jan. 28, 1956

The treatment of persons with cerebral palsy requires the cooperation of specialists in the professions of medicine, education, and sociology. All are necessary members of a team, whose combined efforts have led to an advance in the care and provision of adequate services for the cerebral palsied.

The medical measures useful in the treatment of physical disorders resulting from cerebral palsy include: 1) passive and active exercise and muscle retraining, 2) use of braces for support and restraint of muscle action, and 3) surgical operations on muscle, nerve, bone and joint. The training of the orthopedic surgeon has always included a consideration of the management of these deformities, and cooperation with auxiliary personnel in the use of physical measures and application of braces. For this reason the orthopedic surgeon is well qualified to play an important role in the treatment of the patient with cerebral palsy; however, recent tendencies have been to place greater emphasis on the treatment by physical therapy so that the role of the orthopedic surgeon is diminishing.

History shows that from the beginning of the treatment of the cerebral palsied, the discriminating orthopedic surgeon has used all three methods of treatment: physical therapy, bracing, and surgery, reserving the last for use only on certain patients in whom it was considered essential.

At present it is felt that surgical treatment should be delayed until the effects of bracing and training have been appraised, or as long as the patient is making good progress with other therapy. Early operation, however, may materially shorten or eliminate the need for physical therapy.

A study of 354 operations performed on 165 patients during a 10 year period, showed that 67 per cent gave good results, 18 per cent fair, and 14 per cent showed poor results. The criteria for evaluation of the operations were correction of deformity, and substantial improvement in muscle function and skill. Poor results were generally due to technical failures, errors in judgment, or improper timing of the operation. It was felt that the cumulative effect of treatment by operation was considered to be worthwhile to the patient.

It is essential that a qualified physician should continually evaluate the patient, to ascertain his needs and keep the treatment up-to-date. A therapeutic team is the ideal approach to the treatment of the cerebral palsied patient, but one qualified person needs to be in charge of integrating the efforts of the team members. The orthopedic surgeon is well qualified for this role, and has a large and important part to play in that portion of the program which concerns the physical treatment.

Results of Cortisone and ACTH Treatment of Rheumatic Fever

M. S. Hecht, W. E. Shelden, A. Nolke, D. Hofstra, and E. West, J. PEDIAT., 48:300-307, March 1956

A study has been made concerning the effects of cortisone and ACTH upon patients with rheumatic fever. Differences of opinion exist concerning the greater effectiveness of hormones as compared to salicylate treatment. There were 2 main groups of subjects involved in this study—114 were treated during the "prehormone" period of 1946 to 1950 and received either salicylates or no specific treatment. During the years 1950 to 1953, 122 were treated with either of the 2 hormones.

Only those patients exhibiting signs of carditis received hormone therapy. The dosage of oral cortisone, given every 6 hours, was varied both according to individual need and to the length of time during which it was being administered. In most instances 150 mg. per day for approximately 2 weeks was found to be the most adequate dosage for suppression of rheumatic activity. If the hormone was administered for an 8 week period, a 2 week "tapering off" period followed this in order to decrease the dosage. More recently, 40 to 60 mg. of ACTH have been administered daily for 4 to 7 days after the termination of long periods of treatment with cortisone. One of the most difficult problems involved was that of the proper time to stop medication. No known tests by which signs of relapse could be determined were found to be adequate. Bed rest, low sodium diets, medicinal potassium, and penicillin were also administered.

Certain undesirable side effects of hormone therapy were noted. Among the most outstanding were the production of certain signs of the Cushing syndrome, such as transient mild glycosuria, moderate elevation of blood pressure, a rise of the white blood cell count, and abdominal distention. Increased difficulty with those children in cardiac failure was found to be due to the salt and water retention effect of both hormones.

The group treated with salicylates, usually aspirin (¾ grain per pound per day), received the same supportive measures and follow-up care given to the hormone-treated group.

A comparison of the 2 groups reveals some interesting factors. Those treated with cortisone spent a longer time in the hospital, but required a shorter period of convalescence than the group receiving salicylates. The number of deaths was less and the incidence of reversal of signs of valvular lesions was greater in the cortisone-treated group than in the group treated otherwise.

Although the administration of cortisone and ACTH is not presented as a cure for rheumatic fever, its value in suppressing the inflammatory reactions of rheumatic activity is advocated.

Congenital Vertical Talus

H. Osmond-Clarke, J. BONE & JOINT SURG., 38-B: 334-341, February 1956

Attention is drawn to that type of rigid congenital flat foot in which the talus lies vertically instead of horizontally.

This deformity is rare, but if not treated successfully leads to an ugly, painful foot in adolescence.

The experience of 5 patients forms the basis of this report. One adolescent and 2 young children under the age of 5 were treated unsuccessfully by both conservative and operative measures. More recently in 2 children with bilateral deformity open operation was successful in restoring the shape of the foot.

The operation is essentially a reduction of a subluxation at the talonavicular and subtalar joints. It entails freeing the head of the talus sufficiently to allow it to be lifted dorsally and laterally. The talus is then anchored in position by transplanting the distal end of the peroneus brevis tendon through the neck of the bone.

The Parietal Lobe as an Additional Motor Area

J. F. Ross Fleming and Elizabeth C. Crosby, J. COMP. NEUROL., 103: 485-512, December 1955

This study attempts first, to confirm the fact that movements may arise from the posterior and superior parietal cortex, and second, to determine whether or not these movements depend upon an intact motor cortex. The methods used are described and the complete studies of three typical monkeys are given in detail. The experiments included parietal cortical stimulation, parietal stimulation after excision of precentral and postcentral gyri, and clinical observations after cortical excisions.

Various points on areas 5 and 7 were stimulated electrically. In general, the motor representation in area 5 mirrored that in the precentral and postcentral gyri, but the motor responses differed in several respects. The parietal cortex had a higher threshold than the motor cortex. The responses from area 5 involved more mass movements and lacked the precision and fine detail of those from area 4, with the greatest movements being at the more proximal joints. Responses from area 5 often involved both the contralateral extremities and one or both of the ipsilateral extremities, sometimes combined with a turning of the head and eyes toward the opposite side. There was variation in the responses obtained from a given point on area 5 in contrast to the almost invariable stimulation topographic representation of the motor cortex.

Six stimulation experiments were performed on various monkeys after either recent or old excisions of the precentral and postcentral gyri on one or both sides. From these experiments it may be concluded that motor responses to stimulation of areas 5 and 7 can be obtained after both the ipsilateral and the contralateral precentral and postcentral cortices are removed.

Experiments were performed in which various areas were excised in the precentral and postcentral gyri and areas 5 and 6. The changes observed after ablation included slight transient impairment of the voluntary use of the contralateral extremity with slight weakness and hypotonia. These changes disappeared by about the tenth postoperative day.

In the discussion the authors relate several instances where the posterior parietal area is concerned with the production of movement in human patients. It is the authors' suggestion that the parietal efferent system, like those from the other second motor areas, plays an integral role in the production of voluntary movements. Voluntary movements may represent the sum total of impulses coming from many regions of the cortex capable of yielding efferent impulses. It is also stated that "second" motor areas appear to lie in fairly close anatomical association with afferent areas of the cortex, each of which is concerned with different modalities of sensation. Therefore movements which occur in response to various afferent stimuli may arise from the second or additional motor area adjacent to the appropriate receptive cortex. The authors pose the following question. "Is it too presumptuous to suggest that the clinician might make use of the large number of additional motor areas and their close association with different afferent areas?" For instance, a child who has lost the motor areas might be trained, by appropriate visual, sensory, and auditory associations, to develop more completely potentialities of the corresponding second motor areas with the resultant production of some useful voluntary movements.

Dynamic Exercises After Lower Extremity Amputation: Rehabilitation of the Elderly Amputee

Otto Eisert, GERIATRICS 11: 65-70 February 1956

In the treatment of elderly patients, consideration must be given to: (1) physiologic factors which include diminished muscle power, prolonged reaction time, lessened adaptation of the cardiovascular system, and impaired learning and retention ability; and (2) pathological factors which include chronic disease and gait disorders characterized by weakness, unsteadiness, and a wide base.

Physical procedures must be started as soon as possible in order to maintain and improve: (1) skeletal muscle function in terms of strength, endurance, and coordination; (2) range of motion; (3) neuromuscular reactions; and (4) gait patterns.

Dynamic or coordination exercises are taught utilizing movements similar to those used in actual walking. The author includes a description of eight exercises. These exercises are simple and require comparatively little effort on the part of the patient. They are especially suitable in the treatment of the elderly amputee for whom motivation and expenditure of energy are important.

A Winter Outbreak of Poliomyelitis in New York City

J. L. Melnick, J. R. McCarroll, and D. M. Horstmann, AM. J. HYGIENE, 63:95-114, January 1956

An epidemiological study of an outbreak of poliomyelitis was made. Three residents of a New York apartment building developed paralytic poliomyelitis within a month's time. The January 1955 occurrence was during cold and dry winter weather. The first case was a 3 year old nursery school girl; the second a 29 year old father whose son also attended the nursery school; and the third, a pregnant mother whose son had contact with nursery school children.

There were 56 apartments in the building, 23 of which were in the south wing which housed the 3 paralytic cases. There were 3 types of households: 23 families with children; 14 couples without children; and 16 apartments of unmarried nurses. There was generally a close social relationship between the families, especially between the children.

Rectal swabs and stools of 108 people were tested. Type 1 poliomyelitis virus was evident from 23 people—15 children and 8 of their parents. Multiple infections was the rule. No adults who came from a household without children were carriers.

From 124 people blood samples were taken and tested for complement-fixing (CF) and neutralizing antibodies of all 3 types of poliomyelitis virus. C.F. antibodies were demonstrated in the sera of 44 persons, of whom 24 were children and 16 were parents. A high percentage of the adults, but no children, possessed Type I neutralizing antibodies but not C.F. antibodies. These people were probably "immune." When these nonsusceptible persons were eliminated, infection rates were 50 per cent for all adults and 95 per cent of the parents.

These results emphasize the extremely high contagiousness of poliomyelitis when there is close contact among people and especially when children are in the environment.

The Application of the Overload Principle to the Learning of Motor Skill

C. Etta Walters, AM. J. OCCUP. THERAPY, 10:1-6, January-February 1956

Previous studies have been concerned with the "overload principle" for developing cardio-respiratory endurance and muscular strength. Therein, working with maximum effort was demonstrated to be important.

The purpose of this paper is to demonstrate a similar idea, that is using "stress" as a means to facilitate learning of a motor skill. Stress is referred to as forced learning within tolerable limits.

The effect of stress on the learning of 2 sensory motor skills was studied. The subjects were 18 adult females, 19 to 57 years of age. All subjects were highly skilled and could be expected to learn a skilled activity more readily than a poorly skilled or disabled person.

The subjects practiced and were scored for speed on the Minnesota Rate of Manipulation test. There were two parts: (1) the Turn and Place Test and (2) the Displace Test, both consisting of placing 60 cylinder blocks in holes in a board. All participants practiced with their preferred hand, 4 trials each test, 5 days a week for 4 weeks. Each week they were tested on their preferred hand and every fourth week both hands were tested. They were placed in 4 groups, 3 experimental groups who trained under some form of stress and 1 control group trained in a nonstressful manner.

Speed and/or accuracy were the "stress" conditions of the 3 experimental groups. In one group the subject practiced to the rhythm of a metronome with increasing speed as determined by her accuracy. In the second group, the subject worked as rapidly as possible, setting her own pace and correcting all errors. The third group was also self-paced, but did not correct errors. The fourth, nonstressful group, were paced by a metronome but at a speed 12 per cent slower than their initial performance.

All test scores were computed as per cent improvement in time over initial performance and learning curves were constructed. For both tests, the learning curves and the per cent improvement for the 3 experimental groups was significantly greater than for the nonstressed group. Of the 3 groups training under stress the difference in the weekly mean improvement is slight. Therefore, motivated self-pacing can be just as effective as the outside stimulus of the metronome. It was also demonstrated that the experimental groups gained as much by indirect training on their nonpracticed, nonpreferred hand, as the control group did with direct training.

Respiratory Irregularities in Newborn Infants

A. Robert Bauer and Philip J. Howard, POSTGRAD. MED., 19: 161-167, February 1956

Periodic breathing is normal in the newborn infant, but the appearance of periodic, or Cheyne-Stokes, breathing in an adult is very serious. Because of this severity, it has been of great interest and has been studied in newborn and premature infants. In this study a body plethysmograph was used. A spirometer was attached directly to the plethysmograph and permanently recorded on a kymograph the volume of air moved by the actions of the chest and abdomen. The movements of the chest and abdomen were studied by means of pneumographic tracings.

In the beginning of the studies attention was directed to the types of breathing. The phase was called positive when the chest and abdomen expanded together. The phase was called negative when the chest retracted as the abdomen expanded. It was shown that there was no greater efficiency in tidal air or minute volume during the positive phase than during the negative phase. The interpretation of this phenomenon was that respiration was due chiefly to diaphragmatic action, with that of the chest being secondary and probably serving only as a good firm foundation from which the diaphragm could work. It was pointed out that lack of coordination between the chest and abdomen in newborns is normal, and that it is equally normal for the phase to change from positive to negative without any measurable change in the tidal air or the minute volume.

Next, studies were made to determine what effects the percentage of oxygen in the respired air would have on the irregularity of breathing and on changing the efficiency of respiration. An attempt was made to interpret the information obtained from these studies and those of other investigators. It was suggested that these findings represent only a small part of a finely balanced set of regulatory functions for the respiratory system. It is also suggested that these seemingly paradoxical situations might be a part of a protective mechanism to help the infant, rather than a significantly pathologic process. Therefore, irregularity of breathing *per se* in a newborn infant is not an indication for drastic therapeutic measures. Also, the authors have tried to show that administration of 40 per cent oxygen will accomplish as much as higher concentrations in stimulating respiration. This is becoming a matter of great importance, because evidence is accumulating rapidly to indicate that toxic results of oxygen administration, such as retrolental fibroplasia and pulmonary irritation, occur from concentrations higher than 40 to 50 per cent.

The First Stages of Swallowing

Earl R. Miller, CLINICAL SYMPOSIA, 8:37-41, January-February 1956

Use of a high speed cineradiograph has made it possible to make a more detailed and proper analysis of swallowing. The films were taken at a speed of 60 frames per second. Accompanying a series of radiographic frames showing the process of swallowing, there is a complete description of the action of each structure involved.

Contents of the mouth are moved backwards by a forward and upward movement of the tongue. With a backward stripping action of the tongue, the bolus of food is thrust against the posterior pharyngeal wall. At this time the epiglottis arches backward and downward until it touches the pharyngeal wall and reaches a 60° angle below the horizontal. The food then passes around the epiglottis which afterward assumes its original position.

Meanwhile the larynx reaches its fullest excursion upward and with a last thrust the base of the tongue pushes the food downward. The soft palate, by pushing against the posterior pharyngeal wall, tightly closes the nasopharynx and thereby prevents upward regurgitation. The larynx, after rising upward to allow food to pass into the esophagus, descends to its original position.

In the posterior musculature of the pharynx a peristaltic constriction can be seen following which the structures assume the neutral position once more.

Moebius' Syndrome—Congenital Oculofacial Paralysis

Bertram E. Sprofkin and J. William Hillman, NEUROLOGY, 6:50-54, January 1956

Moebius' syndrome is the term applied to a rare type of paralysis or paresis involving both the external rectus muscles of the eye and the muscles of the face.

Weakness of the adductor muscles of the eye is seen in restriction of internal rotation of each eye when both are used together in lateral gazing. Involvement is bilateral, severe but usually incomplete and more often affects upper facial muscles such as the frontalis. Muscles moving the angles of the mouth inferiorally and laterally, i.e., the platysma, are less frequently involved. Cases have also been reported in which masseter muscle paralysis and pterygoid muscle weakness was present, thus showing occasional involvement of the trigeminal nerve.

Characteristic features of this syndrome (one of the most important being bilateral involvement of the sixth and seventh cranial nerves) included an everted lower lip, open mouth and a speech defect involving difficulty in producing labial sounds. Facial involvement is usually noted during the first few days of life due to nursing difficulties and inadequate closure of the eyelids during sleep. Facial movements are absent upon crying or smiling, and whistling and wrinkling the forehead are often an impossibility.

Concomitant with these features has been the occurrence of other congenital defects including deficiencies of chest musculature, club foot, extra digits, deafness, mental defects, and epilepsy. In one case, discussed in detail by the authors, the subject also had deformities of the lower extremities characteristic of arthrogryposis multiplex congenita. The possibility of a common etiology between congenital oculofacial paralysis and arthrogryposis multiplex congenita was noted in the last case.

An exact etiology of the syndrome has not, as yet, been established. Suggestions include a defect in the embryonic stages of muscle formation causing a primary aplasia of muscle in conjunction with an ectodermic defect at either the myoneural junction, peripheral nerve or motor nucleus. However, the authors seem to favor the theory that the etiology is more concerned with a nuclear hypoplasia of the nervous tissue in various parts of the brain.

Extensor Thrust Restraint for the Cerebral Palsied

Edward L. Binkley and Alice Hill, AM. J. OCCUP. THERAPY, 10:11-12, January-February 1956

Some of the severely involved cerebral palsied patients of the athetoid and rigidity types frequently go into strong extensor thrust. This position, similar to opisthotonus, involves varying degrees of hyperextension of neck, trunk, and hip joints. The thrust is accompanied by increased amounts of body tension interfering with arm and hand function. Consequently sitting, body balance, and using the hands are difficult.

To prevent the extensor thrust for the patient who does not have long leg braces with hip-flexion locks, a restraint was devised. The patient is restrained in the chair with the hips flexed to approximately 90°, with resultant decrease in over-all extension tension.

The restraint, made of 3 pieces of cotton webbing, is individually fitted. One piece fits high and snugly around the chest and buckles in the back. The other 2 pieces go around under each thigh and attach to the chest piece over the shoulders and in back. If extensor thrust continues, the restraint can be tightened.

Good results have been obtained with the use of this restraint in over 12 cases. It has been useful in preventing extensor thrust, thereby aiding over-all relaxation and improving hand function. Other supportive equipment will also be needed.

Traumatic (False) Aneurysms

R. A. Nabatoff, J. W. V. Cordice, Jr., and I. A. McCown, ARCH. SURG., 72: 277-283, February 1956

A traumatic aneurysm of a vessel may develop when there has been partial injury to a vessel. Several days or weeks after injury of an artery, persistent bleeding and a pulsating hematoma usually occur. If the clot is absorbed and an endothelial sac membrane is formed, the lesion becomes a false or traumatic aneurysm.

A traumatic aneurysm produces only a few symptoms. There may be moderate pain, signs of arterial insufficiency, and pressure on nerves. Over the lesion a systolic bruit is felt. The skin is shiny, firm, tender and warm. Blood can be aspirated from the mass.

There is an element of danger in postponing surgery, but if possible it is desirable to wait until all infection and hematoma have subsided and circulation appears to be adequate. If there are complicating signs such as violent hemorrhage, progressive ischemia, marked spreading infection, and ensuing nerve damage, immediate surgery is indicated.

At the time of operation, excision of the aneurysm and restoration of arterial continuity should be attempted. Repair of the artery is necessary if collateral circulation is inadequate and desired if the vessel is vital. An aneurysmorrhaphy or end-to-end suture is performed. However, if there is infection, dead space, or the vessel is diseased, ligation and division of the vessel proximal and distal to the aneurysm should be carried out.

Preoperative lumbar sympathectomy is a valuable adjunct to reduce vasospasm and help develop collateral circulation.

Excitation and Inhibition of Spinal Motoneurons

Adele E. V. Edisen, AM. J. PHYSIOL., 184:223-232, January 1956

The purpose of this study was to investigate the mechanism of afferent excitatory and inhibitory action by measuring the excitability of spinal motoneurons under direct electrical stimulation.

Cats were used as the experimental animals. The cord and nerve roots of L_6, L_7, and S_1 were exposed. Electrodes were applied to the posterior nerve root and to the cord, near the ventral horn. Both points of stimulation were at the same cord level and on the ipsilateral side to the ventral root used for recording.

Direct responses were studied with the cord being stimulated and the action potential recorded at the ventral root. The latency period was seen to decrease with increasing voltages and changing positions of the cord electrode.

To investigate the conditioning of this direct response, the dorsal root was also stimulated to see if the action of dorsal root impulses would facilitate or inhibit the excitativity of motor cells. The time interval after the dorsal root stimulation appeared significant. At first, inhibition occurred about .7 milliseconds after stimulation. From 1-5 milliseconds there was augmentation up to 60 percent. But the longer times of 5-7 milliseconds again caused in-

hibition, followed by augmentation.

Presumably, the excitatory afferent impulses can combine with direct stimulus and thereby cause additional motoneurons to respond. The mechanism of inhibition is not fully understood.

Treatment of Patients with Rheumatoid Arthritis by Physical Means

James W. Rae, Jr., and Leonard F. Bender, J.A.M.A., 160:611-613, Feb. 25, 1956

Of all the agents utilized at any time in the treatment of rheumatoid arthritis, physical and occupational therapy are high on the list of measures of proven value. In spite of this, patients are frequently seen who have undergone intensive therapy of less proven value, and yet have had no physical treatment. A thorough evaluation of the patient is essential to the planning of an adequate rehabilitation program, including consideration of general medical condition, functional capacity, vocational, psychosocial, and financial status. Taking all these factors into account, specific goals should be set up.

There are 5 classes of physical measures which can be used alone or in various combinations: 1) heat, 2) massage, 3) therapeutic exercise, 4) occupational therapy, and 5) assistive and supportive devices.

Heat is useful for relief of pain and muscle spasm. Massage may increase venous blood or lymph flow, and may have either a sedative or stimulating effect. Direct massage over the joints is not desirable, and any massage should be light when the joints are acutely inflamed. Exercises utilized in physical therapy are usually designed to increase strength, endurance, coordination of muscles, and correct or prevent deformities.

Occupational therapy is useful in evaluation of the patient and teaching of hand dexterity and activities of daily living. It may also provide the patient with an avocation or vocation.

Light weight splints may be of value in preventing or correcting deformities.

The physician must consider a long-range treatment program for patients with rheumatoid arthritis, since it is a disease which lasts many years. The greatest part of the patient's time is spent at home, so that there is a need for thorough instruction in home programs for physical management of rheumatoid arthritis. Many patients fail to carry out prescribed treatment procedures over a long period of time. The patient needs to be advised of the nature of the disease, and encouraged to participate in the setting and reaching of goals. Careful and adequate instructions, both verbal and written, are necessary, and frequent rechecks on an outpatient basis are desirable in order that the home treatment program may be always in conjunction with his present condition. It is the patient himself who is most responsible for the success of the treatment program.

The Diagnostic Value of the Electromyograph

Paul A. Shea and Ward W. Woods, BRIT. J. PHYS. MED., 19:36-43, February 1956

The purpose of this paper is to review the present clinical applications of electromyography. The results observed in normal and denervated muscle are discussed. No electrical activity is recorded in testing a normal human skeletal muscle at rest. With active contraction a normally innervated muscle will yield a simple diphasic wave. If such a muscle has been denervated by lower motor neuron disease, then three important abnormal action potentials are observed. Those of denervation fibrillation in the resting muscle appear as monophasic and diphasic spikes on the cathode ray oscilloscope and elicit a characteristic high-pitched, clicking sound on the loud speaker. Also, in the resting muscle the wave forms produced by fasciculations are characterized by a large, spontaneous, complex or polyphasic action potential, occurring in an arrhythmic manner. The sound is that of a low-pitched thump, like that heard when a shotgun is fired at a distance. A muscle in which the nerve supply is regenerating or degenerating will contract in an asynchronous manner and thus produce an unmistakable polyphasic, or complex wave form. This wave form produces a characteristic sound which resembles the strained, chugging sound of an old four-cylinder automobile engine.

The uses of the electromyograph in the diagnosis of various neuromuscular disorders are discussed. The importance of its use is explained for each specific disease or disorder. Various diagrams and tables are included in the paper to further clarify the text.

The authors conclude with a list of certain sources of error which must be avoided if electromyography is to be of value in diagnosis. A large bibliography follows.

Lumber and Sacral Compression Radiculitis (Herniated Lumbar Disk Syndrome)

Donald Monro, NEW ENGLAND J. MED., 254: 243-252, Feb. 9, 1956

This paper is a report of a clinical investigation carried out over 17 years on 545 patients who either had or were believed to have had a low lumbar and upper sacral compression radiculitis. The most frequent cause was a ruptured intervertebral disk with protrusion or extrusion of a nucleus pulposus; however, other changes causing the radiculitis were found to be almost as important. Various aspects of the causal background, the diagnosis, conservative therapy, operation, fusion and convalescent care are discussed.

The commonest fundamental cause of injuries leading to a lumbar or upper sacral compression radiculitis was "lifting," the next commonest "a fall," and the third commonest was undetermined and was listed as "no cause." From the various other causes, which occurred only 10 or fewer times, it was apparent that almost any body activity can produce back alterations leading to compression radiculitis.

It is the belief of the author that the patient with suggestive signs and symptoms of compression radiculitis should be given the benefit of every appropriate diagnostic procedure. These patients should also be given the benefit of a long enough period of conservative nonoperative therapy so that the physician can be relatively sure that relief of symptoms cannot be cured without operation. This includes such measures as bed rest, traction, hyperextension of the spine, massage, manipulation, injection of Novocain or its derivatives into spastic muscles, judicious exercise, muscle stretching, and muscle strengthening. Details of the operation, complications, pathology, and need for fusion are discussed.

It is felt that the convalescent care of patients that have been adequately operated upon for compression radiculitis is as important as the

operation in as far as invalidism and return to work goes. A description of the entire convalescent program is given. This includes procedures to be carried out, procedures not to be carried out, and limitations that will apply for the rest of the patient's life.

The Respiratory Displacement of the Larynx: A Study of the Innervation of Accessory Respiratory Muscles

B. L. Andrews, J. PHYSIOL., 130: 474-487, November 1955

The electrical activity in fifteen muscles acting directly or indirectly on the larynx of the anesthetized rat was examined. A group comprising the sternothyroid, cricothyroid, genioglossus, epiglottis, styloglossus and stylopharyngeus was found to be active during inspiration.

The position of the larynx in the intact animal remained fixed over a wide range of respiratory activity, but if the genioglossus and styloglossus muscles were denervated the larynx descended with each inspiration during dyspnea and hyperpnea. This movement was due partly to the tension developed in the trachea during inspiration and partly to the contraction of the sternothyroid muscles.

A search was made for evidence of a reflex control of laryngeal equilibrium, but although sensory sources were demonstrated it appeared that the balance between the forces acting on the larynx was struck centrally with little or no reference to sensory information.

The Cutaneous Sensory Modalities—A Critique of Their "Specificity"

Francis Schiller, ARCH. NEUROL. & PSYCHIAT., 75: 203-219, February 1956

It is widely believed that, whatever the effective stimulus, a certain anatomically distinct sense organ will transmit to consciousness none but its own sensory quality. This axiom of specificity is carried over to sensations other than vision, hearing, smell, and taste—in other words to the fifth sense of "feeling." The general statement is that a fixed and specific structural chain, from receptor to its representation in the cortex, must invariably be responsible for what we call "hot," "touch," "painful prick," no less than there are specific structural chains for what we call "blue," a "high-pitched sound," or "bitter." The objections to this reasoning are based on physical, anatomical, physiological, psychological, and semantic grounds. This paper is an attempt to follow the argument about specificity through the following stages: physical stimuli, sensory spots and nerve endings, nerve fibers, spinal cord tracts, and cerebral representation of sensation.

The reports of many investigators in this field are discussed under each of these headings. Many of these reports attempt to substantiate the old theory, but more and later ones support the fallacy of specificity. This extensive analysis very convincingly leads to the possibilities for a revised hypothesis of our "fifth sense."

Protrusions of Thoracic Intervertebral Disks

Kenneth H. Abbott and Richard H. Retter, NEUROLOGY, 6: 1-10 January 1956

Patients first diagnosed as suffering from various cardiac, pulmonary or abdominal disorders, have found to have protrusion of a thoracic intervertebral disc. The incidence of protruded thoracic disc is appreciably less frequent than lumbar disc derangement.

These authors have reported a total of 64 cases. In these patients the levels at which protrusions were found, ranged between that of T_1 and L_1 with exceptions of T_3 and T_4. Multiple disc lesions were found in two cases. The authors suggest trauma as an important etiologic factor if the proper congenital and degenerative conditions are present.

Types of thoracic disc protrusions may be divided into three groups giving consideration to location and symptoms. Some patients have central disc protrusion with anterior compression of the spinal cord above the conus medullaris. Both paresthesia and pain of a radicular nature are found in the back and lower extremities. Secondly, there is central disc protrusion in the area of T_{11} and T_{12} with compression of the conus medullaris and cauda equina. In these cases, there is great pain in the back and lower extremities, loss of sphincter control, motor weakness in the sacral and lumbar segments, saddle anesthesia and subsequent involvement of lumbar dermatomes. A third type is lateral disc protrusion showing evidence of nerve root compression. Although pain is also radicular in nature, there are minimal or no sensory changes. If there is spinal cord compression, it is reversible. Symptoms which arise are often confused with visceral disturbances as pain and paresthesia are felt in the trunk.

All except one patient in this series were benefited by surgical treatment. Early recognition and correction is important. Procedures used were a wide laminectomy for more centrally located discs, and hemilaminectomy in the more laterally placed discs. In the latter case, a dorsal rhizotomy was used when the nerve had been severely damaged.

What Is Realism in Occupational Therapy

Beatrice Fields, AM. J. OCCUP. THERAPY, 10: 9-10, 34, January-February 1956

This is a discussion concerning the realistic approach to selecting modalities for occupational therapy. Realism, as defined, is concerned with things as they are, as distinguished from the abstract and speculative.

The therapist should ask himself if he is considering the subjective or objective selection of modalities for use in treatment. Is the therapist's choice based on personal preferences or on objective and realistic evaluation of the patient, the goals, and the environment in which the patient is to function? Modalities should be consistent with the vocational, psychological, and functional demands of the patient.

Because man is living in an industrial age, it is sometimes believed that rehabilitation tools should be largely of the industrial media and arts and crafts relegated mainly to the habilitation or rehabilitation of children. In order to maintain occupational therapy as an effective form of treatment in rehabilitation, it will be necessary for the therapist to use arts and crafts as well as industrial tools. The evaluation of the environment is a "realistic" one, but it is man who is being treated not the environment.

The therapist should not allow a patient to submissively accept treat-

ment by use of a specific modality. The therapist should explore the patient's total needs and desires in relation to his limitations in range of motion, coordination, or any impairment interfering with function.

Because occupational therapy will require expansion in keeping with expanding knowledge, it is necessary for tools and modalities to remain flexible enough to meet changing conditions. Therefore, an occupational therapist should have flexible attitudes and be capable of directing all skills placed at his disposal that contribute to the treatment of the patient.

If occupational therapy is to make a sound approach to the rehabilitation of a patient, the therapist must consider new ways of applying old arts as well as new industrial equipment.

The Effect on Muscle Strength of Maximum Isometric and Isotonic Contractions at Different Repetition Rates

Nancy Salter. J. PHYSIOL., 130: 109-113, October 1955

There has always been controversy concerning the most efficient method of producing a rapid improvement in muscle strength. The variables which must be considered in planning an exercise program include: isometric or isotonic contractions; Maximal or submaximal contractions; duration of each contraction; the repetition rate and the total number of contractions per session; the total number and spacing of the sessions. This paper reports the results of a study of training of supination of the left hand in 20 normal subjects to compare the effect of repeated sessions of isometric and isotonic contractions. Sessions of 30 maximum contractions made at a repetition rate of either 2 or 15 per minute were used.

Sixteen training sessions were carried out over a period of four weeks, the effect of these being assessed by the difference between two groups of four tests made in the weeks immediately preceding and following the training period.

A test consisted of 5 maximum isometric supination contractions made at half-minute intervals. The reliability of isometric test contractions as criteria of improvement in strength following different methods of training was considered.

All training procedures resulted in an improvement in muscle strength, but no significant difference was found between the four different methods used.

No correlation was found between the amount of improvement in muscle strength and the degree of "fatigue" resulting from the training sessions.

Division of Tibial Collateral Ligament for Removal of Medial Meniscus

Julius S. Neviaser, J. A. M. A., 159: 1595-1598, Dec. 24, 1955

There have been numerous operative procedures and special instruments devised to facilitate complete removal of the medial meniscus from the knee joint. The most simple and direct surgical approach is by division of the tibial collateral ligament. This study is concerned with 68 patients who underwent this procedure, and 4 others who had the fibular collateral ligament divided for removal of the lateral meniscus.

The author happened on the procedure by accident while operating on a patient whose meniscus ruptured while being removed, leaving a portion attached posteriorly which could only be reached by cutting the tibial collateral ligament. With the tibial collateral ligament divided, the inner aspect of the knee joint can be easily and fully inspected by abducting the leg. The medial meniscus can be removed by severing its attachment around the head of the tibia. The ligament is sutured with the knee in extension, and a plaster walking cast applied. Following the removal of the cast in about 3 weeks, physical therapy measures are undertaken to increase strength of the quadriceps femoris.

Of the patients who underwent surgery, the most frequent lesion was a longitudinal tear of the meniscus, usually in the posterior segment. This type of tear would be missed in the usual anterior medial approach. The operative procedure permits complete inspection of the medial meniscus and some of the lateral meniscus. In 3 cases where pathology of the lateral meniscus was noted, a separate anterior incision was made to remove the lateral meniscus.

Period of follow-up varied from 3 months to 8 years. The functional result in all cases was good. Patients returned to work from 6 to 8 weeks after surgery, depending on how much labor was required in their jobs. All signs of atrophy were gone by 18 to 30 months after surgery. Stability of the knee joint was not usually impaired, especially with contraction of a strong quadriceps.

Advantages of this operative procedure were: (1) reduction in operative trauma and scarring of the articular cartilages; (2) allowance for inspection of more than half of the joint for investigation for other joint pathology; (3) avoidance of any further operation for removal of the posterior segment of the meniscus.

Lumbar Sympathectomy for Arteriosclerosis

Edward A. Edwards and Chilton Crane, ARCH. SURG., 72: 32-37, January 1956

Lumbar sympathectomies were performed on 100 patients suffering from arteriosclerosis of the lower extremities. In all cases the major arteries of the lower limbs showed moderate to severe occlusion. In the group, ages ranged from 34 to 82 years and included 79 males and 21 females. Twenty-seven of the patients also had diabetes.

The patients were followed and the results tabulated up to 5 years after the sympathectomy. At this time 39 patients had died, most of them because of coronary heart disease. Of those that survived some common characteristics were noted. Generally, their disease had a slower onset and progression than that of the nonsurvivors. There had been more localized necrosis rather than over-all ischemia. The postoperative effect of the sympathectomy was usually successful.

Most of the patients had not required amputations. Ten had above knee amputations—all in the first year after the sympathectomy. These patients had an over-all deterioration of the limb and were also mostly diabetic. Three patients had transmetatarsal or toe amputations.

The postsympathectomy condition of the limb was classified as: (1) good (patient fairly active and usually working), (2) fair (patient's activity moderately restricted and pain-free), and (3) poor (patient had persistent pain or required amputations). The majority of the patients had good postoperative results. Of the patients who had poor results 28.6 per cent were not living 5 years later. The diabetic

patients also showed poorer results than the nondiabetic ones.

A lumbar sympathectomy is advocated for the patient with moderately progressed arteriosclerosis. Usually only a unilateral sympathectomy is performed. Some patients may require additional surgery on the other side. The patient with a relatively localized arterial involvement of slow progression responds well to sympathectomy and has a good life expectancy.

Origin of the Dorsal Root Reflex

Chandler McC. Brooks and Kiyomi Koizumi J. NEUROPHYSIOL., 19: 61-74, January 1956

Stimulation of the dorsal roots and afferent fibers produces antidromically conducted impulses of the dorsal root reflex. The purpose of this study was to present evidence concerning the origin and nature of this reflex.

Decerebrated cats under the influence of ether were used for the study. Various skin, muscle, and mixed nerves and dorsal roots were stimulated electrically. The dorsal root potentials and reflexes were picked up from cut or isolated filaments of the dorsal roots.

After appropriate electrical stimulation potentials were recorded. The potentials of the reflex varied in amplitude and duration. The reflex was most readily evoked when dorsal roots were stimulated directly. Potentials, however, were also recorded if skin or mixed nerves were stimulated. Only when the spinal cord was placed in a cool environment would stimuli to muscle nerve afferents be sufficient to cause a reflex. Under correct temperatures stimulation of all afferents caused reflex activity. Whereas cooling the cord to a limited extent facilitated the dorsal root reflex, warming the cord decreased the amplitude and duration of the reflex. The reflex is conducted over those afferent fibers which conduct at 30m./sec. or faster.

The reflex was studied under the influence of certain drugs. A subtetanic dose of strychnine had little effect. Increased doses augmented the reflex. Guanidine increased the reflex and eventually caused a spontaneous tetanic antidromic discharge. The reflex is suppressed by stimulation of the suprabulbar reticular formation.

Extirpative Surgery for Pulmonary Tuberculosis

Gordon W. Thomas and John S. Whittaker, CANAD. M. A. J. 74: 193-197, Feb. 1, 1956

Resection for pulmonary tuberculosis has now become well accepted and, combined with chemotherapy, is frequently the procedure of choice. It has rapidly come to supersede thoracoplasty. The procedures of phrenic crush, pneumoperitoneum and pneumothorax no longer have a place in the treatment of pulmonary tuberculosis.

The pulmonary resection procedures most frequently used are: the pneumonectomy, lobectomy, and segmental, subsegmental, and wedge excisions. The aim of resection is the eradication of active disease and destroyed lung tissue as well as the conservation of normal lung tissue.

Sixty resections on 58 patients were done in the Grenell Hospital, St. Anthony, with a rate of cure of 86 per cent, an operative mortality of zero, and a late mortality rate due to tuberculosis of 3.5 per cent.

Hand Volumetrics

M. V. Eccles, BRIT. J. PHYS. MED., 19: 5-8, January 1956

An accurate measurement of hand volumes was found advantageous in the course of developing different methods of treatment for hand conditions. In this article the author describes an apparatus which measures the hand volume to about a quarter of one per cent with accuracy. Information obtained by the use of this apparatus is then discussed.

The principle of the apparatus is that of displacement of water. Two small syphons are placed one inch below the upper edge of a tank measuring 6 by 3 by 11 inches deep. One syphon has a brass nozzle ¼ incl. in diameter and the other 1/16 inch in diameter. The hand to be measured is placed in the tank in a specific way. The rise in water level floods the syphons and the water running off is collected in measuring flasks. The larger syphon takes the bulk of the water but stops first. The smaller syphon continues until surface tension breaks.

It was found that the volume of a normal hand varied as much as 15 milliliters during the course of one day. This variation is caused by many factors, the most important being atmospheric temperature and activity. A normal hand immersed in a wax bath for 30 minutes was found to increase 6 to 7 per cent in volume while a swollen hand increased by 5 to 10 per cent, the higher increases being in the hands with smaller original swelling. When a normal hand was treated by wax in elevation the volume increased by 3 to 4 per cent. A swollen hand under similar conditions increased by 0 to 2 per cent. No measurable alterations in volume were found after treatment by anodal galvanism or after short-wave diathermy. It was found that by far the greatest decrease in swelling was obtained overnight with the hand supported in elevation.

Growth Curves of Height and Weight by Age for Boys and Girls, Scaled According to Physical Maturity

Nancy Bayley, J. PEDIAT., 48: 187-194, February 1956

During the prepubertal age of maturing a child has a rapidly accelerated rate of growing. This growth spurt, however, is not at the same time for all children, since the ages of maturation vary. A child may grow most rapidly at 11 years of age, or later when he is 14. Therefore, each child has his own time schedule of growth. The growth rate of a child is compared to the normal growth curve of children of similar physical maturity. Grouping for similarity is determined by x-rays of hand and knee and by the per cent attained of each child's own adult stature.

The normal growth curves presented were grouped in this way. They were based on a survey of 300 healthy children (with an equal number of each sex). Their heights and weights were recorded at intervals from birth until 18 to 21 years.

Those children who are either tall or short only because of rapid or slow maturation will not necessarily be exceptionally tall nor exceptionally short adults. Those who have an accelerated bone age and rapid growth will be tall adults.

Two methods may be employed to determine a child's physical maturity. Skeletal age of the hand is a good indicator of maturity and predicted height. Another way to evaluate a child's growth is from

his annual increment in height and weight. Comparing these increments for past years with a group maturing at that rate will help to predict rate of growing for the future.

A child's weight curve should be in the same channel as his height curve. More rapid increases in weight also occur in the prepubertal period, but should level out with maturation.

Chlorpromazine and Human Spasticity. An Electromyographic Study

J. V. Basmajian and A. Szatmari, NEUROLOGY, 5: 856-860, December 1955

This paper is an extension of an earlier article by the authors in which a dramatic abolition of spasticity with the use of chlorpromazine in 11 of 13 spastic subjects was reported. In this report, 4 adult paraplegics and 1 cerebral palsied boy were added to that series. In addition 5 cases of choreoathetosis and 1 case of parkinsonism were studied.

Electromyographic recordings of resting muscles, tendon reflexes, voluntary contractions, irradiation phenomena and clonus were made before and after the administration of chlorpromazine. Concurrent observations were made on the state of consciousness and any associated phenomena. All patients were kept recumbent for at least an hour.

In 15 of 18 patients dramatic abolition of spasticity for about 2 hours was obtained by the rapid intravenous injection of not more than 50 mg. of the drug while lesser effects were observed in the other three in the series. In a boy with cerebral palsy the effect lasted more than 20 hours.

Voluntary muscular activity was unaffected except in one quadriplegic who reported a brief transient paralysis of a partially-affected limb.

The effects were not related to the state of consciousness. Most patients remained highly cooperative, though some became quite sleepy.

No effect on the involuntary movements or the reflexes was recorded in 5 cases of choreoathetosis and no depression was seen in a normal subject's neuromuscular responses.

Two cases of parkinsonian tremor were relieved temporarily, in contrast to the occasional appearance of such a tremor in long term therapy for psychosis with chlorpromazine and reserpine.

The possible modes of action of the drug are discussed. The effect is apparently a depression of overbalanced facilitatory influences of the brainstem reticular nuclei.

Our Abstractors for June

We are indebted to the following for their assistance in preparing the abstracts for this issue:

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Book Reviews . . . . .

Expanding Horizons in Medical Social Work. *Edited by Dora Goldstine, Professor, School of Social Service Administration, University of Chicago; Former President of American Association of Medical Social Workers. Cloth; price $5.00. Pp. 274. University of Chicago Press, Chicago, 1955.*

Dora Goldstine, who died in the summer of 1955, was Professor in the School of Social Service Administration, the University of Chicago, and had served as President of the American Association of Medical Social Workers Committee.

This companion volume to her earlier work, *Readings in the Theory and Practice of Medical Social Work*, is a selected collection of articles by prominent authorities in the field. In these two books, Miss Goldstine has attempted to provide a comprehensive survey of professional problems and practices.

Expanding Horizons in Medical Social Work presents 23 articles illustrative of the medical social workers broad areas of responsibility as they relate to the administration of medical social services within various medical and health agencies; participation in community organization or planning; contribution to professional education, both of social workers and of related professions; and research. The articles were selected especially because of the expression of ideas provocative of further exploration or indicative of trends for the future. These articles present an accurate picture of recent advances in medical social work services and an appraisal of future developments.

From the point of view of a practicing medical social worker it is felt that a clear concept of the medical social worker has emerged in the professional group. There is a sureness about the validity of the role, the usefulness of the service, the contribution to the patient, the medical team, and to the community expressed in all of these articles. The approach is fresh and stimulating and holds the interest.

In the article "The Road to Rehabilitation," Helen J. Almy writes that if all the members of the medical team can begin to help the crippled child early enough, their teamwork may obviate the need for formal rehabilitation measures. All the members of the medical team have a responsibility for recognizing and considering social factors affecting the individual. The aim of all is rehabilitation. Any program that fails to plan for the social, as well as the medical rehabilitation of the crippled person and his eventual placement in the niche where he can best function falls short of its real objective.

Another article, "Group Counseling with Mothers of Children with Cerebral Palsy," by Harry V. Bice and Margaret G. Davitt Holden, discusses the value of a group experience for these mothers. In this group they were able to express how they felt about attitudes of medical personnel and of lay people to their children. And, perhaps most important, their own attitude towards their handicapped child. The line of demarcation between what the mother must do for the child and what she should expect him to do for himself is a difficult one to discover. Solicitude, care, service, and protection beyond what is actually needed give so much satisfaction to the child and the mother that he demands they be continued. Nevertheless, the failure to do all that is possible to develop independence and desirable personality traits adds one more liability to the already badly handicapped child.

The group experience helped the mothers to express and resolve some of their negative feelings. It was of value in that it helped the mothers to see their children from a more objective viewpoint, thus enabling

them to cooperate with the medical group providing help.

It is felt that other members of the medical team would find this book answers many of their questions about the role of the medical social worker and the goals for the future in medical social work. Since each professional member in the medical setting gains by a better knowledge of the contribution of each member of the team, this book is of value.

Essentials of Orthopaedics. *By Philip Wiles, M.S., F.R.C.S., F.A.C.S., Secretary, British Orthopaedic Association; Treasurer of the Editorial Board, Journal of Bone and Joint Surgery. Revised Edition. Cloth; price $10.00. Pp. 486; illus. Little, Brown and Company, Boston, 1955.*

Mr. Wiles has chosen an apt title for his book, *Essentials of Orthopaedics.* His scope as indicated by the title is limited, and this is necessary, for the field he represents has grown remarkably in the past few years. A single volume text can do little more than present briefly the pertinent points to introduce the neophyte and the nonspecialist to the present day concepts of orthopaedic surgery. As pointed out by Mr. Wiles in the preface to the first edition of this work, there are differences in the approach to and practice of orthopaedics in England and in the United States. These differences do not alter the value of the book.

Mr. Wiles' purpose is to afford the uninitiated a relatively simple introduction to his field. This he does admirably, keeping his material in concise clear form, well organized, in a regional arrangement. This allows the book to serve as a quick reference, pointing out the major problems of the different body levels.

The section on "Postural Defects" presents a simplified introduction to body mechanics. Necessarily discussion of the back is limited. I cannot agree with Mr. Wiles in his condemnation of corrective wedges for malaligned feet and extremities. His description of these phenomena is satisfactory. The discussion of the "Spine and Its Defects" is worthwhile and will give the beginners a basis for thinking about the vast and complex subject.

A brief review of the major portion of the book which includes the many important conditions affecting the various anatomical regions is impossible. Suffice it to say that the text is meaty and easily read. After covering regions, Mr. Wiles turns his attention to a section on specific pathological conditions. He discusses pyrogenic infections, tuberculosis, chronic arthritis, bone tumors, and disease of the bone. He touches briefly poliomyelitis and cerebral palsy. Again these sections serve admirably to introduce the student to the field.

The book is well printed on glossy paper. Illustrations are excellent and numerous, adding appreciably to the text. *Essentials of Orthopaedics* is a welcome addition to the orthopaedic literature.

Pediatric Diagnosis. *By Morris Green, M.D., Assistant Professor of Pediatrics, Yale University School of Medicine; and Julius B. Richmond, M.D., Professor and Chairman of Department of Pediatrics, State University of New York College of Medicine, Syracuse, N. Y. First Edition. Cloth; price $10.00. Pp. 436. W. B. Saunders Co., Philadelphia, 1954.*

The authors are particularly well qualified for the preparation of a book of this type, since they, together with the late Dr. Henry Poncher, have been interested for some years in the analysis of symptoms in pediatric diagnosis while at the University of Illinois. This book represents a summary of this experience in a useful and readily available form as it evolved during the teaching programs.

The book is divided into four major sections. The first of these, the pediatric history, is a concise summary of some of the principles involved and the observations possible while obtaining a pediatric history.

The second section, the pediatric physical examination, is the largest of the four divisions. The technics of examination of the various organs and regions are outlined in detail, with the normal findings as well as deviations from the normal described. At the end of each topic the appropriate references have been incorporated directly into the text itself, a technic utilized throughout the book. This innovation is designed to encourage the investigation of the references by the student, and thus provides an excellent source for some of the more important articles concerning the technics utilized, as well as the normal findings and variations encountered.

The third section, devoted to signs and symptoms, represents perhaps the most original contribution of the authors. Twenty-nine topics are discussed, including cough, disturbances in growth, edema, intellectual retardation, vomiting and diarrhea, pallor, and jaundice. A brief account of the normal physiologic process and the various pathologic processes involved is provided, again with appropriate reference material included in the text.

The final section, health supervision, concerns the principles involved and some of the major areas of difficulty in the prenatal period, as well as the infancy, preschool, school and adolescent periods. An appendix with percentiles for weight, height, and other measurements and an adequate index complete the text.

This book is expected to be especially useful to the medical student and young physician in training, both as a helpful guide and source of references. In addition, it may also be useful to other disciplines dealing with children, particularly as a ready source of reference material.

Annual Review of Physiology. *Volume 17. Edited by Victor E. Hall, University of California at Los Angeles. Associate Editors, Frederick A. Fuhrman and Arthur C. Giese, Stanford University. Cloth; price $7.00. Pp. 551. Annual Reviews, Inc., Stanford, Calif. 1955.*

The annual review of physiology is a must for teachers of physiology. The present volume keeps up the same high level as has been the custom in previous ones. The reviews cover a stated period and while not every paper published in that time interval is mentioned, the reviews are generally of the exhaustive rather than of the analytical type.

Some of the reviews are of particular interest for the field of physical medicine and medical physics. Outstanding in this respect is the review by Hertzman on the physiology of heat and cold. The nervous system is reviewed in four reviews dealing with: conduction and transmission (Crescitelli), somatic functions (Livingston and Hermandez-Peon), visceral functions (Burn), and higher functions (Lindsley). There are two chapters on comparative physiology, one dealing with respiration and one with nutrition, feeding, and digestion. An article of considerable importance to the

biophysicist is the review on transport through biological membranes. It has recently been the custom of these annual volumes to include a "prefatory chapter" by a senior physiologist, in which he writes about the development of physiology as he saw it and sees it and gives the readers his ideas about the development and future of the field. These articles have been extremely fascinating reading and this year the chapter by Dr. F. C. Mann of the Mayo Clinic is an unusually interesting one, particularly in the description of his relations with clinical colleagues in one of the nation's outstanding medical institutions. His comments on the development of the young clinician in the research laboratory and on research as an inseparable part of the process of higher education are valuable indeed. Since physical medicine and physical therapy are dependent upon the integration between the research laboratory and the clinic for their development this chapter will be inspiring reading for those in these fields.

Nursing Practice and the Law. *By Milton J. Lesnik, Member of the Bar of New Jersey and District of Columbia; Lecturer in Law, Seton Hall University; Consultant to various nursing associations. Bernice E. Anderson, R.N., Ed.D., Associate Professor of Nursing Education, Teachers College, Columbia University; Chairman, American Nurses' Association, Committee on Legislation; Member, Executive Committee of State Boards of Nursing; Member of Subcommittee on Preparation of Educational Standards to be used as a guide by State Boards. Second edition. Cloth; price $6.00. Pp. 400. J. B. Lippincott, Philadelphia, 1955.*

Because the modern nurse is concerned with legislation that attempts to promote progressive social and civic movements and advance nursing education this Second Edition of *Nursing Practice and the Law* is timely and necessary. Anyone preparing to teach or administer nursing education or to supervise and administer nursing services needs to be up-to-date in the legal aspects of nursing. The sections of this book on nursing legal status and malpractice are adequate and lend themselves to useful teaching because they emphasize principles and pertinent cases. Focus is upon the professional nurse but enough analysis of practical nursing functions is included to show that similar legal problems exist in both groups. The practical nurse is made aware also of certain liabilities her less well established position incurs in contrast to the greater security of the professional nurse.

Nurses will not be alone in benefiting from this book. Other people who will find useful information in it are hospital and public health administrators, physicians, and those who have responsibilities of counseling or teaching related to interpreting or administering the law for nursing service or for nursing education. All readers will be delighted to see how well the authors have accomplished the difficult task of putting into clear and concise language many statements of law and of legal practice that are often expressed elsewhere in involved phrasing that confuses the majority of people. The explanations of problems or principles of practice are understandable in this text and are made even clearer by the use of many illustrations. The end result makes the reader feel as though a sympathetic lawyer had given his personal attention to him while he explained the law, its meaning and relation to nursing, and the procedures involved in solving the legal problem under consideration. The choice of subjects discussed in the book shows that the authors have a primary interest in protecting nurses and in advancing the profession by providing information essential to legal nursing practice. The authors have also performed a real service to nurses by pointing out illegal acts the nurse is to avoid and what recourse to law exists when suit is brought against the nurse.

The organization of this body of knowledge is logical and in good sequence. The large collection of cases that illustrate problems of the nurse and the law add interest and value to the reading. An understanding of such topics as the legal control of nursing, nursing practice acts, contracts, legal status of nurses, and problems of liability, negligence, malpractice, crime, and wills is highly desirable. Such an understanding comes with the study of this text. Faculties of schools of nursing who are looking for a suitable textbook for the study of the legal aspects of nursing would do well to consider *Nursing Practice and the Law* as a guide for students through this important experience of their education.

Hugh Roy Cullen: A Story of American Opportunity. *By Ed Kilman, Editor the Post, Houston, Texas; and Theon Wright, newspaperman and writer. Cloth; price $4.00. Pp. 376; illus. Prentice-Hall, New York, 1954.*

The biography of this great Texas humanitarian has been written by two newspaper men: Ed Kilman, Editor of the *Houston Post*, and a longtime friend and associate of Mr. Cullen; and Theon Wright, a writer who for a long time has resided in the area in which Mr. Cullen built his career.

In presenting the story of one of the greatest philanthropists of all time, the authors particularly stress not only how Mr. Cullen took advantage of every opportunity to advance his personal and professional career, but how he made his own opportunities through perseverance, hard work, and fortitude. Beginning with his withdrawal from school at the age of 12 to help support his mother and five brothers and sisters, through his study of the cotton market and his success as a cotton-buyer at age 18, through his 300 mile horseback ride from Oklahoma to Lubbock, Texas, to claim a homestead (he arrived after having been lost overnight in a freezing, blinding snowstorm the day after all the land had been awarded!), until he went into business for himself at age 22, he used his time to study intensively whatever area of business he was involved in at a particular time. His interest in prospecting for oil developed after he was asked by a friend to support an oil venture by purchasing leases. He later formed his own company and became one of this country's wealthiest men. After repeated successes in bringing in wells he was referred to as the "wildcatter with uncanny luck," but the reason for his success was the intensity and persistence with which he studied oil geology and combined his knowledge with common sense. Time after time his decisions to drill in a certain location were ridiculed and joked about—each time he proved his beliefs, as the well was successful, and he earned the respect of those who had belittled his ideas.

In addition to his business interests he had an interest in both local and national politics that became intensified over the years. At first he fought Jesse Jones in Houston in a local situation involving the ship channel. He moved into a never ending bitter fight against Franklin D.

Roosevelt because he was convinced that Roosevelt's "welfare state" would seriously harm the development of independent enterprise in this country. It was common procedure for him to pepper members of Congress with telegrams spelling out his views and to hire entire pages in local Houston newspapers to bring his views to the attention of the public. He refused a bid to Congress, and spent his time trying to influence people locally to support the candidates he felt were best suited for national offices. He was influential in convincing Mr. Eisenhower to accept the nomination for the Presidency.

His "selfish" (as he termed it) desire to see Cullen money spent "so we can enjoy the spending" began with financial support offered to the University of Houston, included the Houston Symphony and Gonzales Warm Springs and other hospitals. Within 48 hours he gave, "with no strings attached," over four and a half million dollars to the Hermann, Baylor, Episcopal, Methodist and Baptist Memorial Hospitals in Houston. He is almost single handedly responsible for most of the physical development of the University of Houston which he believed should be dedicated to the task of providing every person deserving a college education such an opportunity.

This book will be of interest not only to persons enjoying biographies, but to those interested in observing human behavior, and to anyone interested in giving of his time and talent to help others. The story of Hugh Roy Cullen reveals how one man has developed his own abilities, created his own opportunities, and has realized his responsibilities as a citizen through personal and financial support of education, politics, and medicine that will have a lasting effect on the community and the nation.

Congenital Malformations And Birth Injuries. A Handbook on Nursing. *By Jessie Stevenson West, R.N., formerly Associate Professor of Nursing, Vanderbilt University School of Nursing, Nashville. Paper; price $1.00. Pp. 178; illus. Association for the Aid of Crippled Children, New York, 1954.*

The author has completely rewritten "Orthopedic Conditions at Birth" prepared in 1943. The present handbook contains descriptions of orthopedic conditions found in the original publication and additional congenital malformations and birth injuries of the various body systems and organs.

Newer treatment concepts and methods including the habilitation team are described.

Part IV describes the nurse's observation of infants and young children for the recognition of congenital malformations and birth injuries as a part of the total observation of the child and his environment. A general reference list, sources of publications and visual aids are included.

This handbook is a valuable reference for nurses as well as other team members.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Our Book Reviewers for June

Harry D. Bouman, M.D., Professor of Physical Medicine, University of Wisconsin, Madison.

Louise Hayward, Consultant Public Health Nurse, Physical Therapy, State of New York Department of Health, Albany.

Helen K. Hicky, Educational Consultant, American Physical Therapy Association, New York.

Catharine McClure, Ph.D., Associate Professor of Nursing, University of Pittsburgh School of Nursing, Pittsburgh.

George R. Miller, M.D., Associate Surgeon, North Carolina Orthopedic Hospital, Gastonia.

Dorothy C. Weber, Medical Social Worker, D. T. Watson Home for Crippled Children, Leetsdale, Pa.

Paul F. Wehrle, M.D., Assistant Professor of Pediatrics, State University of New York Upstate Medical Center, Syracuse.

Youth Camps Are Productive Summer Recruitment Projects

Plan now for maximum development of your summer camp recruitment activities. Take advantage of the increased interest in vocational guidance. It has now become an integral part of many camp programs.

First, make a list of the nearby summer camps maintained by your community's youth-serving agencies: health, civic, church, racial, social and fraternal groups. Find the program directors or other persons to contact.

Tell them about the career opportunities physical therapy offers — its challenges and its rewards; tell them about the urgent need for more physical therapists; give them some facts about the physical therapy profession and the place of the physical therapist on the rehabilitation team.

Then ask that a film showing or talk on physical therapy be scheduled for some time during the summer. Plan to distribute informational material to the audience.

The youth-serving agencies which provide summer camp activities include Camp Fire Girls, Boy Scouts, Girl Scouts, Catholic, Jewish, and Protestant youth organizations, YM and YWCA's, YM and YWHA's, 4H clubs and many others.

ORDER YOUR RECRUITMENT MATERIALS EARLY

What's New . . . . . .

130. Multi-Controller

The Tomac Multi-Controller provides an automatic touch control for buzzer system and any four electrical devices. With a slight touch of one small switch, the fully dependent paralyzed patient controls any five electrical devices — separately or all together as he desires. The appliances are selected by a simple touch code the patient learns in a day. Only an imperceptible movement is needed to bring on his radio or TV set, to signal for assistance or turn on a bed light — he can even use the telephone. This can give an immense boost to patient morale and cut down on the number of calls for patient care. American Hospital Supply Corp.

131. Bowling, Anywhere, Anytime

Bowlite — amazingly faithful adaptation of tenpin bowling. Five-ounce, full size plastic pins; two-pound 9 inch rubber ball. Backstop also serves as portable container. Played on any level surface; scored like regular bowling. Quiet, durable. Provides light, competitive exercise. Armstrong Harris Company.

For more information on items write to The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

New items which may be of interest to physical therapists will be mentioned in these pages each month. The accompanying explanations are made by the manufacturers and have not been investigated by the *Physical Therapy Review.*

132. Doorway Gym Bar

Doorway Gym Bar is useful for home exercise programs, for patient's self-help in arising from a wheel chair, or for therapeutic standing. Doorway Gym Bars.

What's New . . . . . .

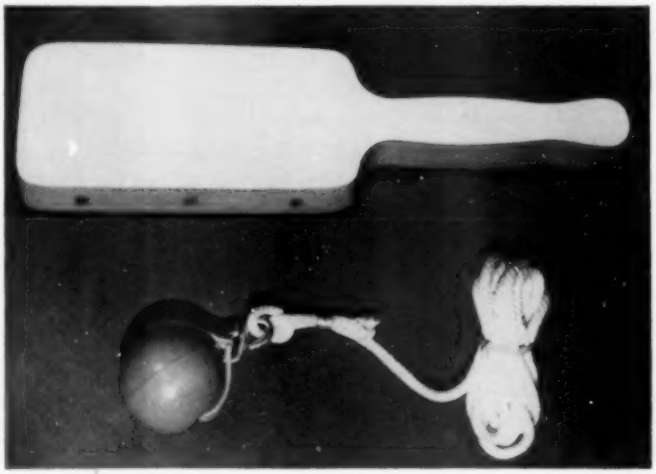
133. Able Kane

Able Kane is lightweight, the manufacturer states, will pick up objects as small as a key and is strong enough to support 300 lbs. Constructed of aluminum, Able Kane is 35½ in. long. A trigger near the handle operates a geared finger at the base. Lee Jordan Enterprises.

134. Block Game

Blockhead is a game that is fun for all age groups and may be a useful aid to the development of coordination and endurance in patients having disabilities of upper extremity functions. Saalfield Publishing Company.

135. Tetherball



Tetherball requires minimum space and is easy to install. The manufacturer also has a multi-purpose aluminum standard which may be used for permanent installation. Tetherball offers activity for developing balance, coordination and endurance. Jayfro Athletic Supply Co.

Rehabilitation Center Executive Training Starts October 1

The Institute for the Crippled and Disabled and the United States Office of Vocational Rehabilitation will prepare a limited number of highly qualified persons for the management and administration of comprehensive rehabilitation centers.

The six months' academic and on-the-job training period will begin at the Institute in New York City on October 1, 1956. Each enrollee will work at three selected rehabilitation centers other than the Institute during the course. Persons accepted will receive individualized instruction and assignments designed to meet their particular requirements in preparing for rehabilitation center executive positions. The curriculum will cover such broad areas as center management and organization, the interrelationship of disciplines contributing to rehabilitation, the center's position and function within its community, patient management and control, financial and personnel considerations, the development and operation of comprehensive evaluation and the devisement of treatment programs to cope with all types of disability.

Age limits are 30 to 50 years. Bachelor Degrees and three years of experience related to rehabilitation are required. Exceptions for especially qualified persons will be made. Stipends of $250 per month and round trip travel expenses between the Institute and job training placements will be paid. Interested persons should communicate with the Coordinators, Rehabilitation Center Administrator's Preparation Program, Institute for the Crippled and Disabled, 400 First Avenue, New York 10, N. Y.

Classified WANT-ADS

Experienced physical therapist with READING and SPEAKING ability in FRENCH desired for a year of duty in France beginning this summer. Contact Box 17, care of the Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

QUALIFIED PHYSICAL THERAPIST needed for supervisor of department in children's orthopedic hospital. Salary $325 per month plus full maintenance, for a single woman, or $400 without maintenance. 15 days' vacation, 15 days' sick leave, 40-hour work week. Contact Leo P. Schwartz, Administrator, Carrie Tingley Hospital, Truth or Consequences, New Mexico.

WANTED: QUALIFIED PHYSICAL THERAPIST, male or female, to take charge of department in 100-bed remodeled hospital. Salary open; 40-hour week. Apply Administrator, Springfield Hospital, Springfield, Vermont.

SOUTHERN CALIFORNIA: There is a critical need for qualified physical therapists in this area to fill a variety of positions. Send for list of openings immediately. Write Dorothy Behlow, Placement Chairman, 621 Groveview Lane, La Canada, Calif.

QUALIFIED PHYSICAL THERAPISTS for immediate placement in established Crippled Children's Hospital and rapidly growing comprehensive Rehabilitation Center treating wide variety of patients. Well equipped therapy department with pools and adequate space. Employee benefits. Maintenance if desired. Write: Jack E. Pearson, Morris Memorial Hospital and Rehabilitation Center, Milton, West Virginia.

PHYSICAL THERAPIST: WANTED for active, well-equipped department in 115-bed hospital with expansion program underway. Pleasant surroundings in north suburb of Chicago. Modern housing. Recreational facilities and cultural activities available. Good salary, 40-hour week, varied cases treated. Apply to Personnel Director, Highland Park Hospital, 718 Glenview Avenue, Highland Park, Illinois.

PHYSICAL THERAPIST in Center for Handicapped Children. Patients mostly cerebral palsied. Center located on college campus in Billings, Montana, a city of about 65,000 population. Merit system coverage with job security, liberal vacation and sick leave, retirement plan plus social security. Salary, no experience: $320-420; with two years' experience: $360-460. Write State Board of Health, Helena, Montana.

WANTED: PHYSICAL THERAPIST for outpatient treatment center, all types of patients treated. Salary good. Forty-hour week, three weeks' vacation, seven holidays, 12 days sick leave per year with pay. Apply: La Salle County Chapter for Crippled Children, Dr. Milton Williams, 628 Boys Street, Streator, Illinois.

QUALIFIED PHYSICAL THERAPIST for United Cerebral Palsy Nursery School and Clinic. Experience with young children (18 months to 5 years) desirable. Physical therapist functions as part of team under medical direction, in a newly constructed department. Salary will depend on experience. Contact: W. Keropian, Children's Hospital, 3700 California Street, San Francisco, California.

Wanted: PHYSICAL THERAPIST, Meriden, Conn. public health nursing agency. New Program. Experience required. Direct services to home patients. Salary dependent upon experience. Personnel policies good. Position available now. Apply Executive Director, Meriden Public Health and Visiting Nurse Association, 212 Colony St., Meriden, Conn.

QUALIFIED PHYSICAL THERAPIST: Excellent professional opportunity. Private Rehabilitation Center, North Suburb of Chicago. Wide variety of patients, Children and adults. Salary dependent upon ability and qualifications. Write Louise Reinecke, Winnetka Rehabilitation Center, 60 Green Bay Road, Winnetka, Illinois.

(Continued on next page)

Classified WANT-ADS

PHYSICAL THERAPIST: STAFF position. Opportunity for varied experience; 650-bed general hospital, near center of cultural and educational activities. Vacation, sick leave, and social security benefits. Apply Personnel Director, Harper Hospital, Detroit, Michigan.

WORK IN FLORIDA: Male or female for staff position in Easter Seal Physical Therapy Clinic serving a 200-bed Duval County General Hospital; 95% adult cases of all types. Mostly outpatients and private referrals. Forty-hour work week, two-week vacation, sick leave, 6 paid holidays, regular increments. Excellent salary. Write: Martin S. Garfinkel, R.P.T., Easter Seal Physical Therapy Clinic, 2000 Jefferson St., Jacksonville 8, Florida.

WANTED: PHYSICAL THERAPIST, 550-bed hospital. Modern department of Physical Medicine and Rehabilitation. All types of cases treated. Salary $280-$330 depending on experience. Social Security and pension plan. Apply Administrative Assistant, The Reading Hospital, Reading, Pennsylvania.

PHYSICAL THERAPIST: for position with new University of California Teaching Hospital. Forty-hour week, three weeks' vacation, sick leave benefits. Graduation from a recognized course in physical therapy and registration with the American Registry of Physical Therapists required. U.C.L.A. Employment Office, 10833 Le Conte Ave., Los Angeles 24, California, BRadshaw 28911, Ext. 344.

IMMEDIATE OPENING: For qualified physical therapist. All necessary modalities for 500-bed general hospital. Excellent personnel policy. Contact Melvin G. Carson, R.P.T., Physical Therapy Department, St. Joseph Infirmary, Louisville, Kentucky.

OREGON'S expanding Rehabilitation Center has opening for physical therapist. We offer mild climate, good living and working conditions, wonderful recreational facilities in city, mountains & Pacific Ocean. Good mgt. and fine team spirit. Salary open. Write Director, Portland Rehabilitation Center, 1615 S. W. 14th Ave., Portland 1, Oreg.

FULLY APPROVED 400-bed general hospital desires an experienced physical therapist to initiate a Department of Physical Therapy and Rehabilitation. Salary $450 monthly, liberal personnel policies. Apply Administrator, Providence Hospital, 2500 W. Grand Blvd., Detroit 8, Michigan.

WANTED: PHYSICAL THERAPIST registered in Delaware to head department in institution for children and adults. Applicant should have some experience in organization and administration of active department concerned with symptomatic and rehabilitative physical therapy under medical supervision. Starting salary commensurate with length and kind of professional experience. Complete maintenance available at nominal monthly cost. Apply to M. A. Tarumianz, M.D., Superintendent, Governor Bacon Health Center, Delaware City, Delaware.

POSITIONS AVAILABLE for qualified physical therapists for active rehabilitation department in modern 500-bed, chronic disease hospital. Salary open. Four weeks' vacation. Sick benefits. Lunches. Apply Superintendent, St. Barnabas Hospital, New York 57, N. Y.

PHYSICAL THERAPIST: In Hospital-School for rehabilitation of children with orthopedic handicaps. Complete interesting program. Good salary, merit increases. Annual paid vacation, sick leave, excellent retirement plan. Write Vera E. Dennis, Director of Physical Therapy, Illinois Children's Hospital-School, 2551 N. Clark, Chicago 14, Ill.

WASHINGTON ELKS' MOBILE physical therapy program needs 2 qualified physical therapists (female) to work with cerebral palsied and other orthopedic conditions. Home and center therapy with parent instruction. Restricted area of travel. Station wagon and expenses allowed when traveling. Excellent salary, paid holidays, sick leave, 2 weeks' paid vacation and other benefits. Contact William C. King, 17222 Third Avenue, N.E. Seattle 55, Washington.

PHYSICAL THERAPIST—Respirator Center has opening for qualified physical therapist which offers opportunity to work with an integrated staff and to participate in rehabilitation of patients with respiratory paralysis. Salary commensurate with experience. Write: Assistant Director, Respirator Center, Chronic Disease Research Institute, 2183 Main St., Buffalo 14, N. Y.

IOWA'S LARGEST PRIVATE HOSPITAL now planning expansion of facilities needs qualified physical therapist. Institution includes 100-bed Raymond Blank Memorial Hospital for Children. Post-polio cases, in- and outpatient work. Competent professional staff and assistants, excellent working relationships. Apply Anthony D. Damiani, Personnel Director, Iowa Methodist Hospital, Des Moines, Iowa.

NEEDED IMMEDIATELY Physical therapist to organize a Home Service Program. Outpatient Physical Medicine Rehabilitation Center in University and capitol city. Excellent personnel policies. Write: Gloria J. Fitzpatrick, R.P.T., Director, Ingham County Curative Workshop, 615 N. Capitol, Lansing, Michigan.

WANTED: PHYSICAL THERAPIST to head and develop department in growing residential rehabilitation center for children; new and modern equipment and building, 45 beds, 5-day week, salary open. Staff vacancy also available. Apply Personnel Director, Crotched Mountain Rehabilitation Center, Greenfield, New Hampshire.

REHABILITATION SERVICES, INC., 200 Court Street, Binghamton, New York, will have staff physical therapist position available September 3, 1956. Modern facilities, outpatient service, established personnel policies, with salary dependent on qualifications. Inquire: Ward A. Merrell, Administrator, Rehabilitation Services, Inc.

Classified WANT-ADS

WANTED: QUALIFIED physical therapist experienced in REHABILITATION technics to treat and instruct patients in arthritis clinics of metropolitan hospitals with some home follow-ups. Must drive car. Excellent opportunity. Apply Arthritis & Rheumatism Foundation, John Bartram Hotel, Philadelphia 7, Pa.

QUALIFIED PHYSICAL THERAPIST, female, for expanding 450-bed hospital. New, fully equipped department. General program, with in- and outpatients. Two-week vacation. 40-hr. week, five paid holidays, sick leave. Good starting salary. Write Miss Blodwen E. Morgan, Director of Physical Therapy, Robert B. Green Hospital, 515 Morales Street, San Antonio, Texas.

STAFF THERAPIST. Work with in- and outpatients. Primarily orthopedic and neurological cases. Fully accredited, new 240-bed general hospital. Write: Donald Wasson, Director of Rehabilitation, Parkview Memorial Hospital, 2200 Randalia Drive, Fort Wayne, Indiana.

WANTED: PHYSICAL THERAPIST. Approximate starting salary $375 to $400 per month depending upon experience. Vacation with pay, legal holidays and generous sick leave benefits. Located in city with a large Air Force Base, close to Colorado Rockies, ninety miles north of Denver. Apply Administrator, De Paul Hospital, Cheyenne, Wyoming.

A STAFF PHYSICAL THERAPIST for rapidly expanding rehabilitation center, either experienced or inexperienced therapist acceptable. Excellent working conditions, 37½-hour work week, good pay, good personnel policies, good medical supervision. Crossroads Rehabilitation Center moved into new building May 1. Wonderful opportunity for staff growth and promotion. Contact Roy E. Patton, Executive Director, 3001 North Jersey Street, Indianapolis, Indiana.

HENRY FORD HOSPITAL, Detroit, Michigan, has vacancies for one senior and one junior staff therapist. Each vacancy implies five-day week, all holidays, vacation with pay, sick leave, group insurance, and retirement benefits. Salary commensurate with experience, and regular increases. Continuous inservice staff training program. The hospital and clinic treats a complete cross-section of medical and surgical disabilities. Its division of Physical Medicine and Rehabilitation is under the direction of two physiatrists. For further information write: Dr. Charles Long II, Division of Physical Medicine and Rehabilitation.

WANTED: PHYSICAL THERAPIST (female) for full or part-time work in orthopedic surgeon's office. Write to Daniel B. Eck, 144 South Harrison Street, East Orange, N. J.

SUPERVISING CEREBRAL PALSY THERAPIST: New Position. Salary $429-$515. Requires California Physical Therapist Certificate or National Registry Certificate as Occupational Therapist plus 3 years' experience, two of which involved cerebral palsy care. Contact Contra Costa County Civil Service, Box 710, Martinez, California.

WORK IN LOS ANGELES, Calif. Several openings for physical therapists at Los Angeles County General Hospital and other hospitals in Los Angeles County Hospital system, including Rancho Los Amigos. Must be graduate of approved school. Good salary, Civil Service benefits. Opportunities for promotion in a rapidly growing area. Write: Personnel Director, Los Angeles County General Hospital, 1200 N. State Street, Los Angeles 33, California.

POSITIONS AVAILABLE for asst. supervisor and staff therapists (male or female). General hospital clinic w/ outpatient service, treating all types of cases. Excellent starting salary with annual increases. Annual paid vacation, sick leave and holidays. Laundry provided. Reply: Miss Mary Mason, Physical Therapy Dept., The Johns Hopkins Hospital, Baltimore 5, Md.

WANTED: Qualified physical therapist for staff position in a 650-bed University teaching hospital including 30-bed rehabilitation center. Two-week vacation, six paid holidays, sick leave benefits. Attractive starting salary. Experience not necessary. Write Harold N. Neu, M.D., Creighton Memorial St. Joseph's Hospital, Omaha, Nebraska.

WANTED: A qualified physical therapist, male or female, for well equipped department in a modern 275-bed general hospital with outpatient service; 40-hours per week; paid vacation, sick leave, 6 holidays; salary open. Apply Robert M. Murphy, Administrator, Lima Memorial Hospital, Linden and Mobel Streets, Lima, Ohio.

WANTED IMMEDIATELY: Physical Therapist registered in Illinois. Contact Personnel, Columbus Hospital, 2520 N. Lakeview Avenue, Chicago, Illinois.

Classified WANT-ADS

RATES

The rate per insertion is $1.00 per line. Typewrite your advertisement carefully and count 50 characters and spaces per line.

ALL WANT-ADS MUST BE PAID FOR IN ADVANCE. Make checks or money orders payable to the American Physical Therapy Association.

Closing date for copy and cancellations is two months preceding publication date.

Institutions or physical therapists who do not wish their identity known may arrange for Blind Ad Code No. All such want-ads must include the following which will be counted as 2 lines:

Address replies to _____ care of **The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.**

IMPORTANT

It is understood and agreed that the publisher shall have the right to reject or change the wording of any advertisement which in the opinion of the Editorial Board shall not be in agreement with the ethical standing of this publication.

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Shorter treatments required with ultrasound save time for the physician and much fatigue and discomfort for patients. Such saving can mean "better and more efficient service"* for *all* your patients.

The Burdick Ultrasonic Therapy Unit is built to Burdick's usual high standards to give years of trouble-free service.

*Matlin, E.: Ultrasonics in General Practice, M. Times 83:788 (Aug.) 1955.

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